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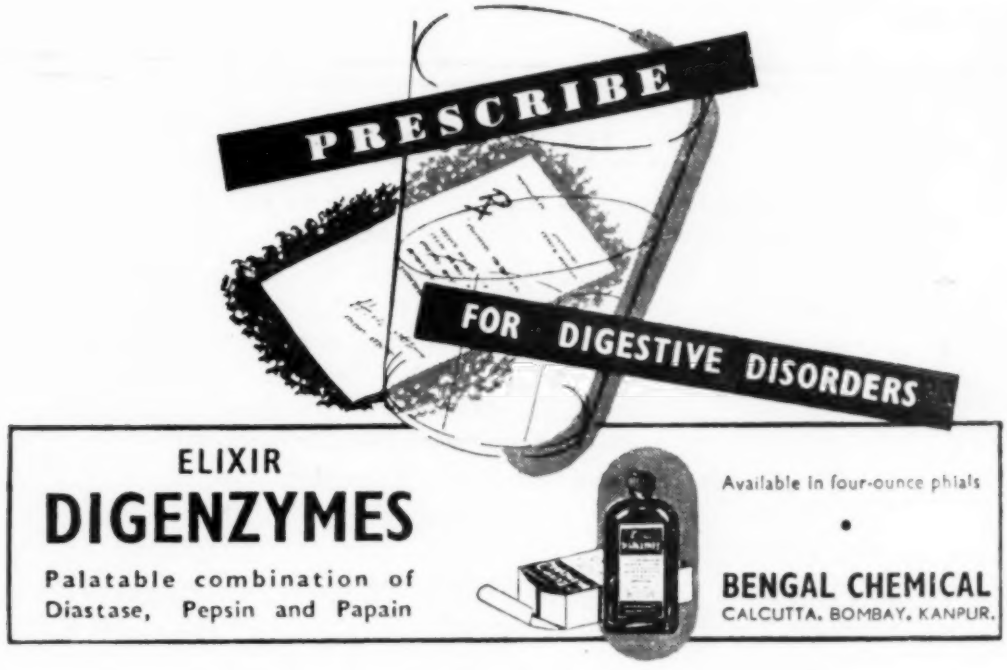

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

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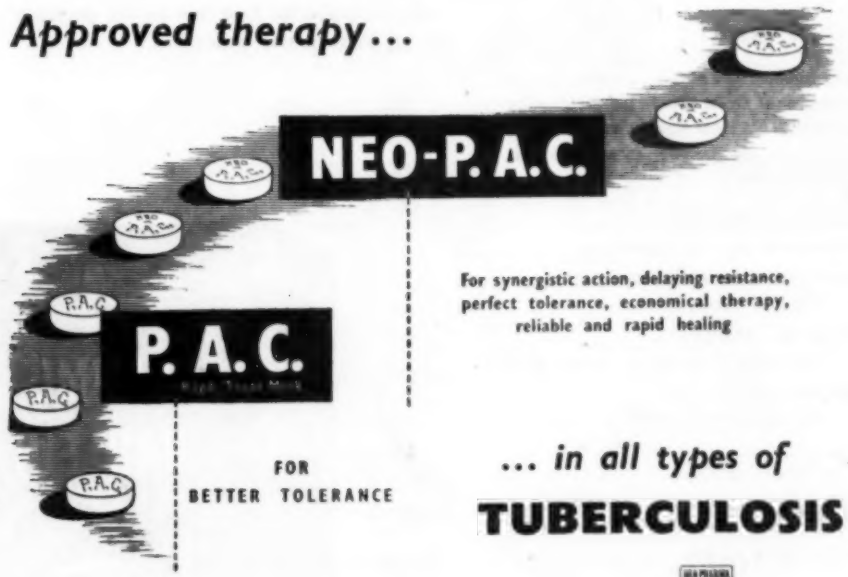

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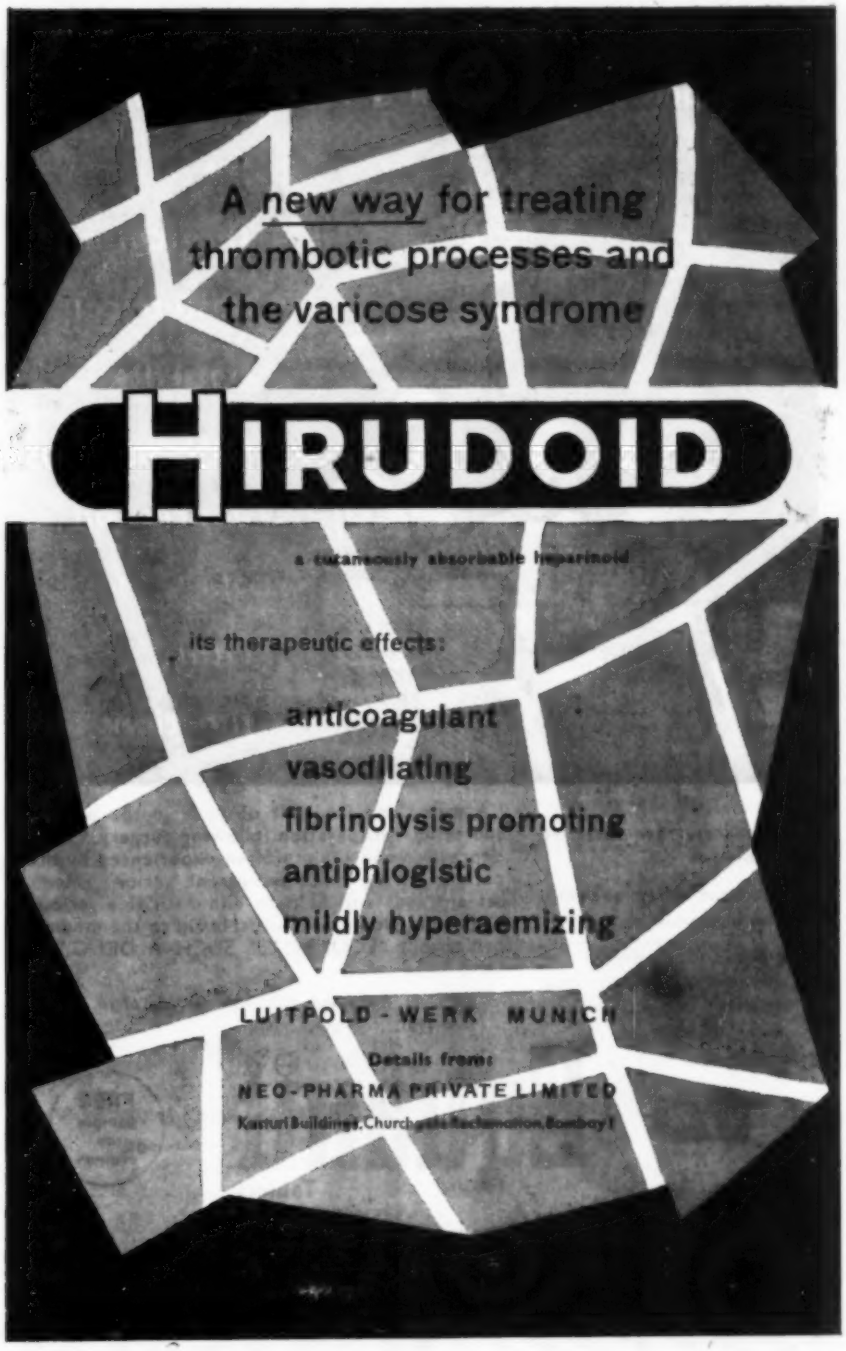
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1. *Lamphier, T.A.: Ann. N.Y. Acad. of Sc., 67:10, p. 810, May 1957.*

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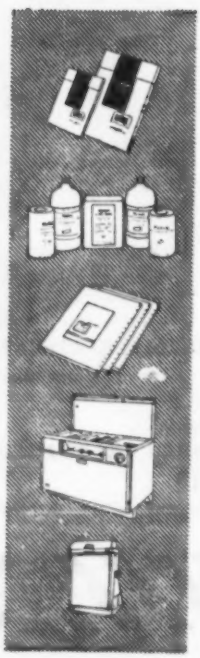

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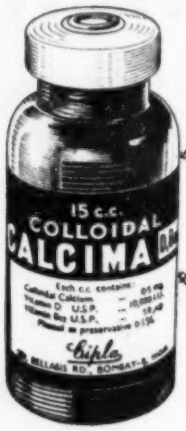

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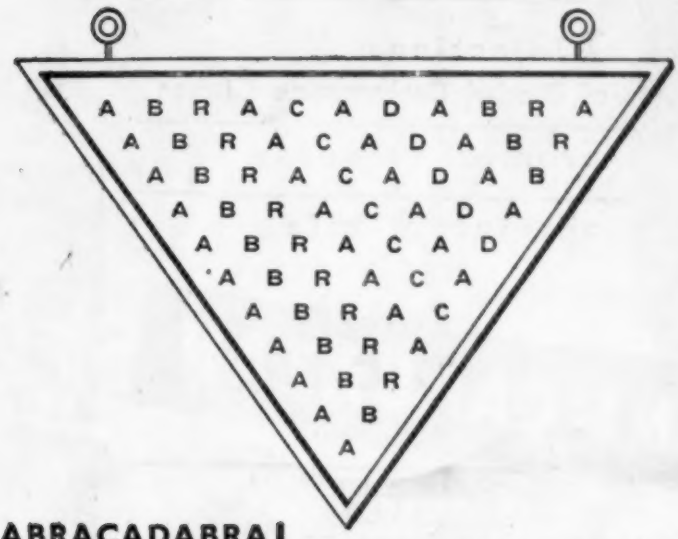

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Serious illnesses can be prevented by making sure that children get sufficient calories and a balanced diet—which means, of course, protein, fats, carbohydrates, vitamins and minerals in the right proportions.

Shaffer (1) would consider the diet satisfactorily balanced when the calories are derived approximately as follows:

15 per cent from protein, 60 per cent from carbohydrates and 25 per cent from fat.

According to Hansen (2), fats are important as a concentrated energy reserve, physical protection for blood vessels, nerves and organs; as insulation against changes in temperature; as a vehicle for absorbing vitamins (A, D, E and K). Fats also stimulate appetite, aid satiety by delaying the emptying time of the stomach and spare protein.

Among poor class children, especially in South India, dry and rough skin is common. The condition is usually attributed to vitamin A deficiency; but the observations of Menon, Tulpule and Patwardhan (3) suggest that dietary deficiency of fat may have something to do with this abnormality.

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(1) Shaffer, Thomas E.—Nelson's Text-book of Pediatrics—Sixth Edn. Dec. 1954—p. 131-32
(2) Hansen, Arild E.—Nelson's Text-book of Pediatrics—Sixth Edn. Dec. 1954—p. 80
(3) Menon P.S., Tulpule P.G. and Patwardhan V.N.—Indian J. Med. Res. (1950) *38;* 173
(4) Deuel H.J.
(5) Nhavi N.G. and Patwardhan V.N.—Indian J. Med. Res. (1946) *34;* 49

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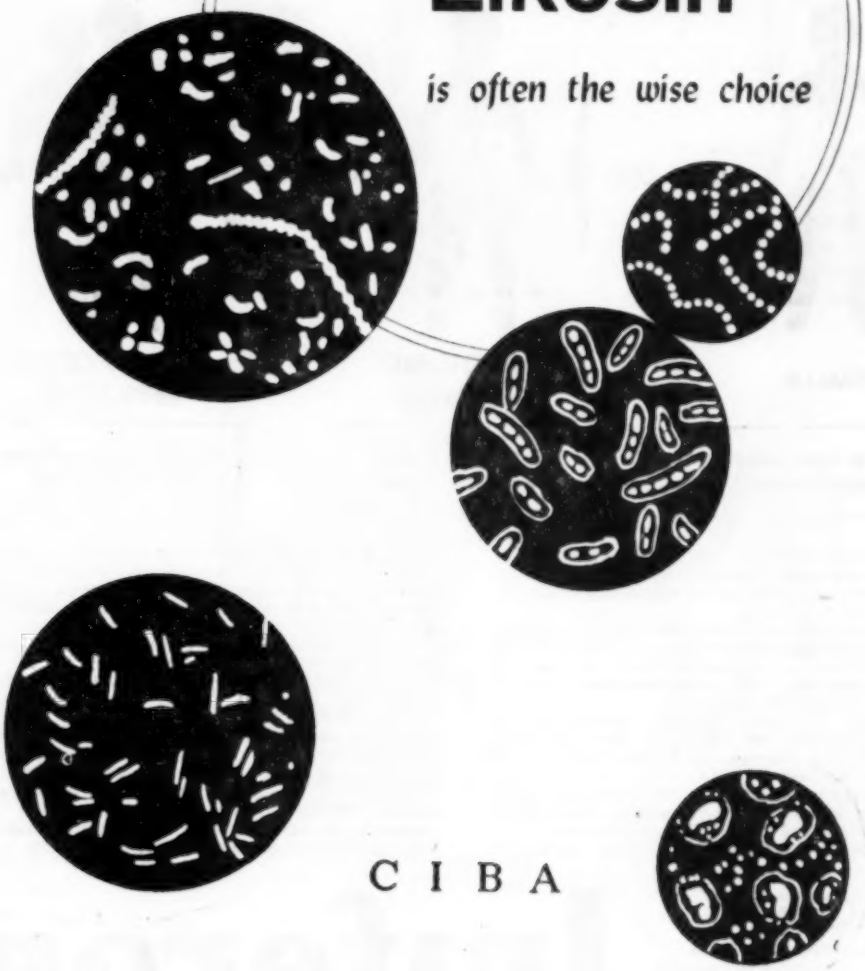

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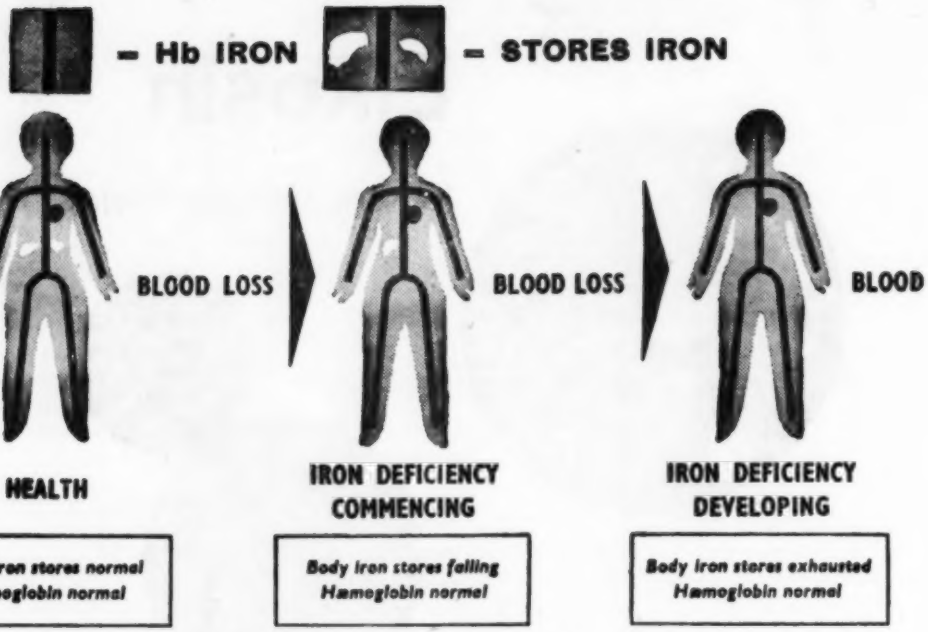
IRON DEFICIENCY
ITS PROGRESSION — ITS REMEDY



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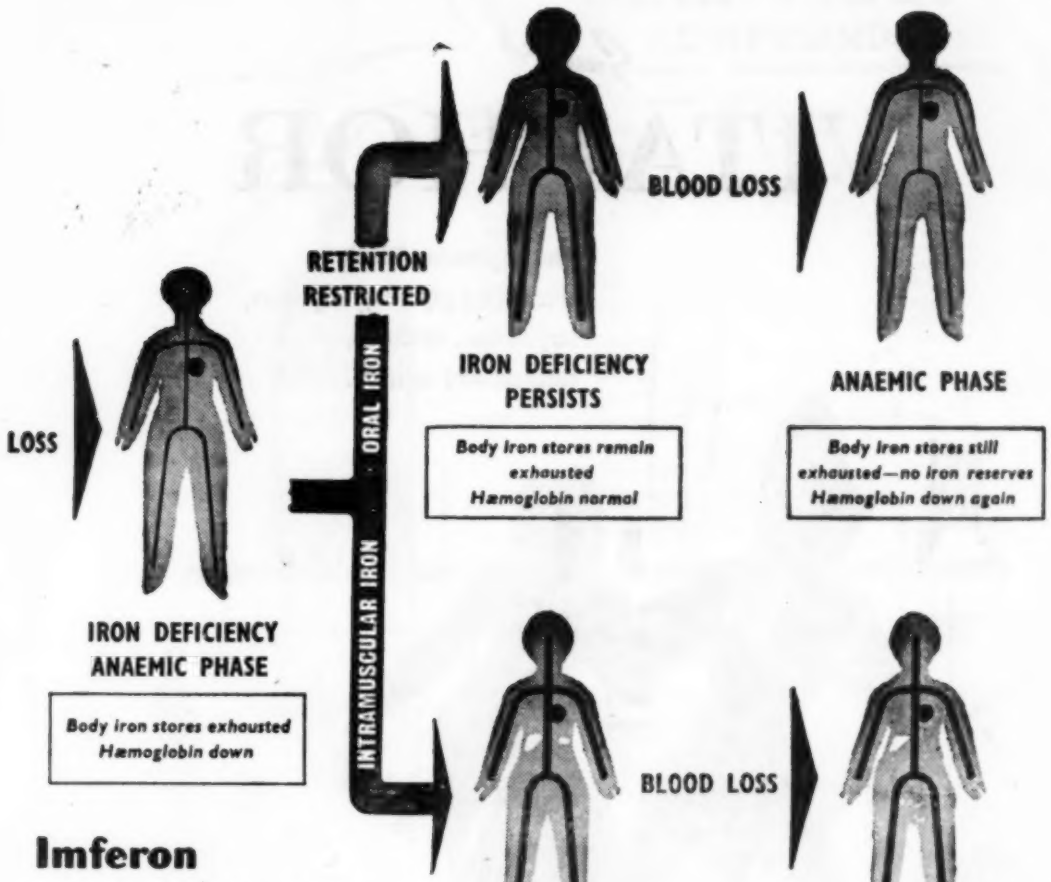

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ORIGINAL ARTICLES

BIRTH WEIGHT AND ITS RELATIONSHIP TO GESTATION PERIOD, SEX, MATERNAL AGE, PARITY AND SOCIO-ECONOMIC STATUS

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INTRODUCTION

The birth weight is an important point for consideration in estimating the health and maturity of the newborn. It is a well-known fact that the birth weight of the infant is closely related to the period of pregnancy as also the age and parity of the mother. The weight of the infant depends on multiple factors, and among the important ones influencing the foetal growth, are the build of the parents and health and nutrition of the mother. MacLennan (1944) has pointed out that a slight increase of birth weight may tip the balance against normal confinement. Thus the birth weight of the infant opens up an important obstetrical consideration as regards its influence on perinatal and maternal morbidity and mortality. The present study deals with the infant's birth weight with a view to determine its relationship to some of the factors mentioned above.

MATERIALS AND METHODS

Our pilot investigation was based on a study of 1054 consecutive births during the last four months of 1957 in the Maternity Department of the R. G. Kar Medical College and Hospitals, Calcutta. The patients able enough to state the exact date of the last menstrual period were only taken up to study the influence of gestation period on birth weight. The gestation period was calcuated from the first day of the last menstrual period. The majority of the patients was of the lower income group and thus could be regarded as belonging to the lower standard of nutrition and poor socio-economic status. An attempt has been made to study the cases of the present series in the following order:

(1) Influence of the period of gestation on the birth weight.
(2) Influence of sex on the birth weight of infant.
(3) Influence of parity on the birth weight.
(4) Influence of age of the mother on the birth weight.
(5) Effect of socio-economic status on the birth weight.

RESULTS

I. RELATION OF BIRTH WEIGHT TO THE PERIOD OF GESTATION:

The frequency distribution of the results on birth weight in pounds obtained at different periods

TABLE 1A—SHOWING DISTRIBUTION OF THE BIRTH WEIGHT BY PERIOD OF PREGNANCY

Period of pregnancy in weeks	Birth weight of children in lb.									Total infants	Mean birth weight in lb.
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
—30 ...	6	1	2	—	—	—	—	—	—	9	2·06
30—34 ...	4	5	7	5	1	—	—	—	—	22	3·23
34—36 ...	1	2	4	12	7	1	—	—	—	27	4·65
36—38 ...	2	—	5	27	41	22	4	—	—	101	5·35
38—39 ...	3	1	4	15	71	55	9	—	—	158	5·72
39—41 ...	2	1	6	35	192	246	91	16	3	592	6·23
41—43 ...	—	—	2	7	24	41	25	6	1	106	6·46
43 and above ...	—	—	—	1	6	10	3	2	1	23	6·59
All periods ...	17	10	30	102	342	375	133	24	5	1038*	5·96

* In 16 out of 1054 cases included in this study, the gestation periods were not recorded.

of gestation are shown in Table 1A. It also presents the average birth weight classified by the period of pregnancy.

The duration of pregnancy among the cases studied ranged from 28 weeks to 44 weeks and this range was divided into 8 intervals as shown in Table 1A. Most of the births took place when the period of gestation was somewhere between 39 weeks and 41 weeks, and the model birth weight was in the range 6-7 lb. The average birth weight including all gestation periods was 5·96 lb. The average birth weights of successive gestation period groups given in Table 1A indicate a progressive increase in birth weight as the gestation period advances having a minimum of 2·06 lb. in the 30 weeks below group and a maximum of 6·59 lb. in 45 weeks above groups. The statistical significance of these results has been established by a linear regression analysis. The significance of the regression coefficient was brought out by the value of *studentised 't' which as estimated from the data was found to be 55·1520. A comparison of the observed and expected birth weights as estimated from the regression relation, viz., $Y=0{\cdot}30431X-6{\cdot}0231$ (Y and X being the mean birth weights and period of pregnancy respectively) is shown in Table 1B.

However, a detailed examination of the data in Table 1B highlights an interesting phenomenon that though there appears to be a progressive increase in the birth weights with the extension of the gestation period, the rate of increase is not always uniform throughout the range of variation of the gestation period. The birth weight increases rapidly with the gestation period upto 35 weeks after which the rate declines and eventually conforms to a linear pattern. In the next step, it was therefore, considered desirable to exclude the observed averages below the limit of 35 weeks in fitting a straight line. The equation of this newly fitted line was $Y=0{\cdot}30409X-5{\cdot}962089$ which is assumed to hold for gestation period 35 weeks and above. The rapid rate of increase of birth weight exhibited in the extremely low gestation period has been simply indicated graphically by a dotted curve deviating from the straight line fitted to the subsequent observation as shown in Fig. 1.

TABLE 1B—SHOWING COMPARISON OF THE OBSERVED AND THE EXPECTED BIRTH WEIGHTS BY GESTATION PERIOD

Mean period of pregnancy	Observed birth weight	Expected birth weight
29·0	2·06	2·80
32·0	3·23	3·71
35·0	4·65	4·63
37·0	5·35	5·24
38·5	5·72	5·69
40·0	6·23	6·15
42·0	6·72	6·76
43·0	7·17	7·06

II. RELATION OF BIRTH WEIGHT TO SEX OF INFANTS BY GESTATION PERIOD:

A further analysis was carried out by dividing the cases into two groups according to the sex of infants to find out their relationship with birth weight and gestation period. A comparison of the

* where $t=\dfrac{(b-\beta)\,S_x\sqrt{n-2}}{(S_y^2-b^2S_x^2)^{\frac{1}{2}}}$

b = observed regression coefficient,

β = theoretical regression coefficient assumed to be zero. S_x, S_y being standard deviations of x, y respectively. x, y being measured from their means respectively.

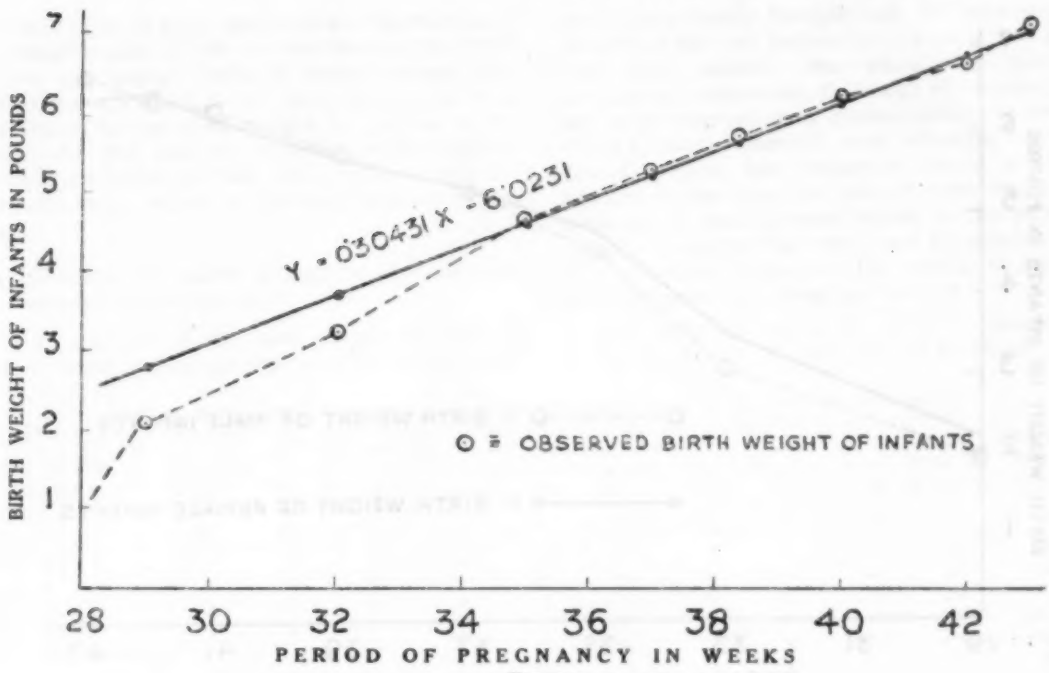

FIG. 1

pattern of variation between the birth weights of male and female babies each by gestation period class is presented in Table 2.

TABLE 2—SHOWING A COMPARISON OF THE MEAN BIRTH WEIGHTS OF MALE AND FEMALE BABIES BY PERIODS OF PREGNANCY

Period of pregnancy (in weeks)	Mean birth weights of babies		
	Males	Females	Total
(1)	(2)	(3)	(4)
	(5)	(4)	(9)
—30	2·00	2·25	2·06
	(12)	(10)	(22)
30—34	3·05	3·50	3·25
	(16)	(11)	(27)
34—36	4·57	4·77	4·65
	(51)	(50)	(101)
36—38	5·35	5·36	5·35
	(83)	(75)	(158)
38—39	5·74	5·70	5·72
	(313)	(279)	(592)
39—41	6·30	6·19	6·23
	(48)	(58)	(106)
41—43	6·37	6·57	6·46
	(10)	(13)	(23)
43—above	6·78	6·47	6·59
Total	6·01 (538)	5·91 (500)	5·96 (1038)

Figures in parentheses denote the sample population corresponding to each individual class.

The mean birth weight of male babies was 6·01 lb. and that of females was 5·91 lb. The average birth weights of male and female babies in successive gestation periods have been graphically represented in Fig. 2.

It appears from the curves shown in Fig. 2 that though for the lower gestation periods male infants are slightly handicapped in respect of birth weights than that of female infants, in corresponding periods of gestation, they seem to gain more weight than their female counterparts when the gestation period exceeds the level of 38 weeks. Since the number of observations in each gestation period class was not adequate to draw any reliable conclusion about the variation between the sexes, no statistical test has, however, been carried out.

III. INFLUENCE OF PARITY ON BIRTH WEIGHT :

An analysis of birth weight was carried out by classifying the terminations according to parity and the results of the analysis are shown in Table 3.

The cases were distributed into 10 parity groups and the highest parity noted in this series was a case of twelfth gravida. Most of the cases belonged to primipara group so far as the individual parity was concerned. The average birth weights varied between 5·67 lb. for the first parity and 6·36 lb. for the 8th parity. Though there appears

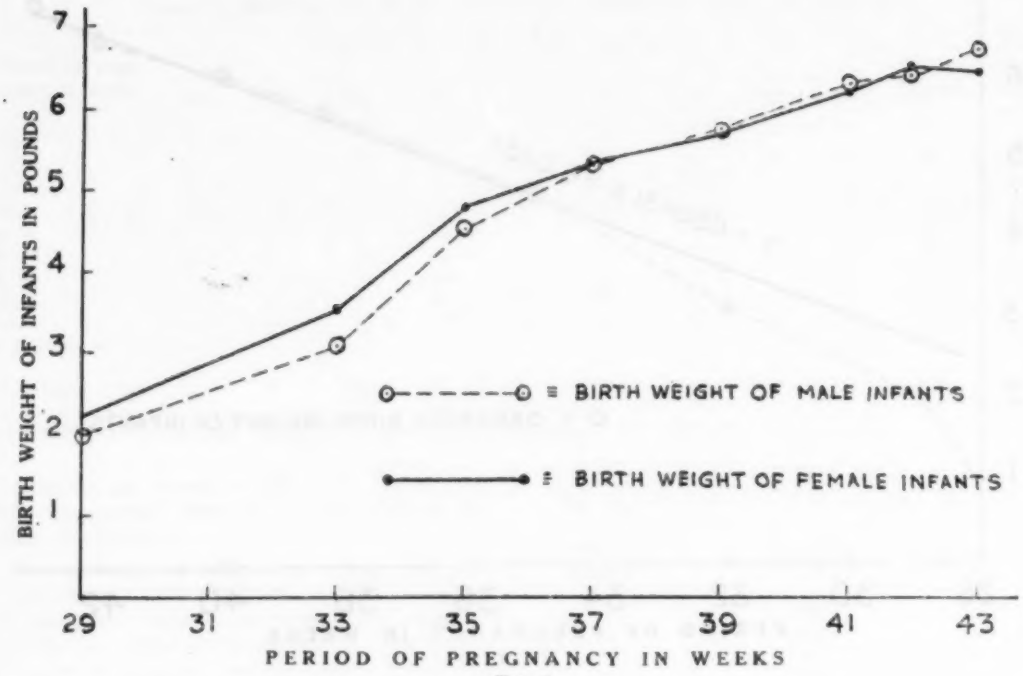

FIG. 2

TABLE 3—SHOWING DISTRIBUTION OF BIRTH WEIGHT BY PARITY

Order of the parity	Birth weights of babies in lb.								Total No. of infants	Average birth weight
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1 ...	3	3	10	45	107	69	29	2	—	268	5·67
2 ...	8	1	4	13	61	64	27	4	1	183	5·93
3 ...	2	2	4	13	40	65	16	1	—	143	5·95
4 ...	—	—	—	6	42	59	16	5	1	129	6·31
5 ...	1	1	7	9	39	43	20	3	1	124	6·03
6 ...	1	1	2	5	22	17	12	5	—	65	6·12
7 ...	—	—	—	6	14	14	4	2	—	40	6·05
8 ...	1	—	1	1	6	14	6	2	1	32	6·36
9 ...	1	1	—	5	8	15	2	—	—	32	5·72
10 and above ...	—	—	4	4	6	17	7	—	—	38	6·00
All parities ...	17	9	32	107	345	377	139	24	4	1054	

to be a tendency for the average birth weight to increase systematically with parity upto the fourth order, the pattern of variation among higher parity is not systematic.

IV. BIRTH WEIGHT AND MATERNAL AGE :

A similar analysis was carried out to demonstrate the relationship of the age of the mother at confinement with birth weight. The results of the analysis are shown in Table 4.

The cases were classified under seven age groups. The minimum age considered in this series was 14 years and the maximum age was 44 years. The maximum number of patients was in the 25-30 years age group and the minimum in the 40 years and above age group. The minimum average birth weight of 5·50 lb. was

noticed in 14-18 years age group and the maximum average weight of 6·23 lb. was observed in 21-25 years age group. Table 4 further reveals that upto the age of 25 years, there appears to be a tendency for the birth weight to increase systematically with age. At higher ages the relationship is somewhat reversed, viz., there is a tendency for the birth weight to diminish with advancing age.

V. RELATION OF BIRTH WEIGHT TO AGE OF THE MOTHER (PRIMIGRAVIDA) :

An analysis of the birth weight by age at confinement carried out separately for each gravida could have clearly brought out the relationship of each of the two factors, viz., gravida and age with birth weights. But when only specific gravidae are considered, the range of variation of age at confinement gets automatically restricted. Further, the number of cases belonging to advanced parities was inadequate for a detailed analysis of this type. In view of these facts, the scope of the analysis was limited to two groups only, (a) primigravidae cases, and (b) second and third gravidae combined. The results of primigravidae cases are shown in Table 5.

The minimum age of the patients considered in this group was 14 years and the maximum was

TABLE 4—SHOWING DISTRIBUTION OF BIRTH WEIGHT BY AGE OF MOTHERS AT CONFINEMENT

Age of the mother	Birth weights of babies in lb.									Total No. of infants	Average birth weight
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
14—18 ...	2	3	2	13	35	21	5	1	—	82	5·50
18—21 ...	4	3	9	28	87	60	16	—	—	207	5·60
21—25 ...	3	—	4	16	72	104	49	4	2	254	6·23
25—30 ...	3	3	9	17	87	107	34	10	3	273	6·09
30—35 ...	4	—	3	18	50	56	20	9	—	160	6·02
35—40 ...	1	1	1	6	15	23	10	—	—	57	5·99
40 & above ...	—	—	2	5	—	8	1	—	—	16	5·56
All ages	17	10	30	103	346	379	135	24	5	1049*	

* In 5 out of 1054 cases the age returns were not complete.

TABLE 5—SHOWING DISTRIBUTION OF BIRTH WEIGHT BY AGE OF THE MOTHER AT CONFINEMENT (PRIMIGRAVIDAE ONLY CONSIDERED)

Age of the women	Birth weight of babies in lb.									Total infants	Average birth weight
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
14—18 ...	1	3	3	16	36	16	4	1	—	80	5·40
18—21 ...	1	1	6	15	42	31	16	—	—	112	5·76
21—25 ...	1	—	1	10	18	10	9	1	—	50	5·89
25—30 ...	—	—	—	1	9	9	1	—	—	20	6·00
30 & above ...	—	—	—	2	2	3	—	—	—	7	5·64
All ages ...	3	4	10	44	107	69	30	2	—	269	

TABLE 6—SHOWING DISTRIBUTION OF BIRTH WEIGHT BY AGE OF THE MOTHER AT CONFINEMENT (2ND AND 3RD GRAVIDAE ONLY CONSIDERED)

Age of the mother	Birth weight of babies in lb.									Total	Mean birth weight
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
14—21 ...	3	2	3	11	39	31	5	1	—	95	5·59
21—25 ...	3	—	3	4	35	61	27	1	—	134	6·22
25—30 ...	2	—	2	7	20	32	6	2	—	71	5·94
30 & above ...	2	—	2	4	8	5	5	1	1	28	5·71
Total ...	10	2	10	26	102	129	43	5	1	328	

37 years. All the patients have been classified under five age groups. Majority of the patients belonged to 18-21 years age group. The minimum average birth weight was 5·40 lb. which was noticed in 14-18 years age group and the maximum mean weight was 6·00 lb. observed in the 25-30 years age group. The pattern of variation of birth weights with respect to age among primiparae cases shows a systematic tendency for the birth weights to gain upto the age of 30 years. Subsequently the birth weights have recorded a fall though no definite conclusion could be stated in view of the inadequacy of the number of observations in the age group 30 and above.

The results of the second and third gravidae (combined) cases are presented in Table 6.

As regards the variation of birth weights among the second and third para cases, the relationship with the age of the mother shows a systematic increase upto the age of 25 years and thereafter a gradual but a consistent decrease with advancing age.

In Table 7A, the combined picture of the effect of gravida and age simultaneously on birth weight is presented.

TABLE 7A—SHOWING DISTRIBUTION OF MEAN BIRTH WEIGHTS BY AGE AND PARITY OF THE MOTHER

Order of the gravida	Age of women 14-21	21-25	25-30	Total No. of term	Unweighted mean birth weight
1	5·61	5·89	6·00	261	5·83
	(192)	(49)	(20)		
2-3	5·59	6·22	5·94	300	5·92
	(95)	(134)	(71)		
Total	5·60	6·13	5·95	561	
	(287)	(183)	(91)		

Figures in parentheses are sample population for each individual sub-class.

It appears from the results shown in Table 7A that though there is a distinct pattern of variations of birth weights with the advancing age of the mother, the effect of parity on birth weight seems to be negligible when the analysis is restricted to the first three parae only. An analysis of variance of birth weights with respect to these two factors has been carried out and the results are shown in Table 7B.

The result of the test reveals that age affects birth weights significantly whereas the effect of gravida is practically negligible. It further shows that the pattern of variation of birth weights with respect to age is more or less same for different gravida.

TABLE 7B—SHOWING ANALYSIS OF VARIANCE OF BIRTH WEIGHT WITH RESPECT TO GRAVIDA AND AGE OF MOTHERS AT CONFINEMENT

Source of variation	Degrees of freedom	Sum of squares	Mean squares	Variance ratio 'F'	Critical values of 'F' at 5% & 1% level
(1)	(2)	(3)	(4)	(5)	(6)
Gravida	1	0·0830	0·3415	0·32388	2·54 6·37
Age	2	18·3268	9·1634	8·69062	2·99 4·60
Interaction	2	3·1323	1·5661	1·48530	3·84 6·64
Error	555	585·1913	1·0544		

N.B.—Special adjustments for the variation in the number of observations over different cells in Table 7A have been made after Yates (1934) in the analysis of variance shown in Table 7B.

VI. RELATION OF BIRTH WEIGHT TO SOCIO-ECONOMIC STATUS :

A more detailed analysis of the relationship between gestation period and the birth weight has been carried out by splitting the patients into two groups according to socio-economic status, viz., (i) birth weights of babies pertaining to mothers delivered in non-paying or general wards, and (ii) birth weights of babies who were born in paying wards or cabins. The object of this stratification according to two economic levels was essentially two-fold. Firstly, it was desirable to observe the changing pattern of birth weights of infants belonging to any of the two economic groups separately with the extension of the gestation period. Secondly, it was necessary to analyse whether there are any marked variations in the

TABLE 8—SHOWING COMPARISON BETWEEN THE MEAN BIRTH WEIGHTS OF PAYING AND NONPAYING GROUPS, BY VARIOUS PERIODS OF PREGNANCY

Period of pregnancy in weeks	Mean birth weight in lb. Paying	Nonpaying	Mean period of pregnancy
(1)	(2)	(3)	(4)
—34 ...	4·50 (1)	2·83 (30)	31·0
34—36 ...	4·50 (1)	4·65 (26)	35·0
36—38 ...	4·56 (18)	5·31 (83)	37·0
38—39 ...	5·80 (20)	5·71 (138)	38·5
39—41 ...	6·48 (96)	6·18 (496)	40·0
41—43 ...	7·09 (17)	6·34 (89)	42·0
43 above ...	7·36 (7)	6·25 (16)	43·0
Total ...	6·28 (160)	5·85 (878)	

Figures in parentheses are sample populations

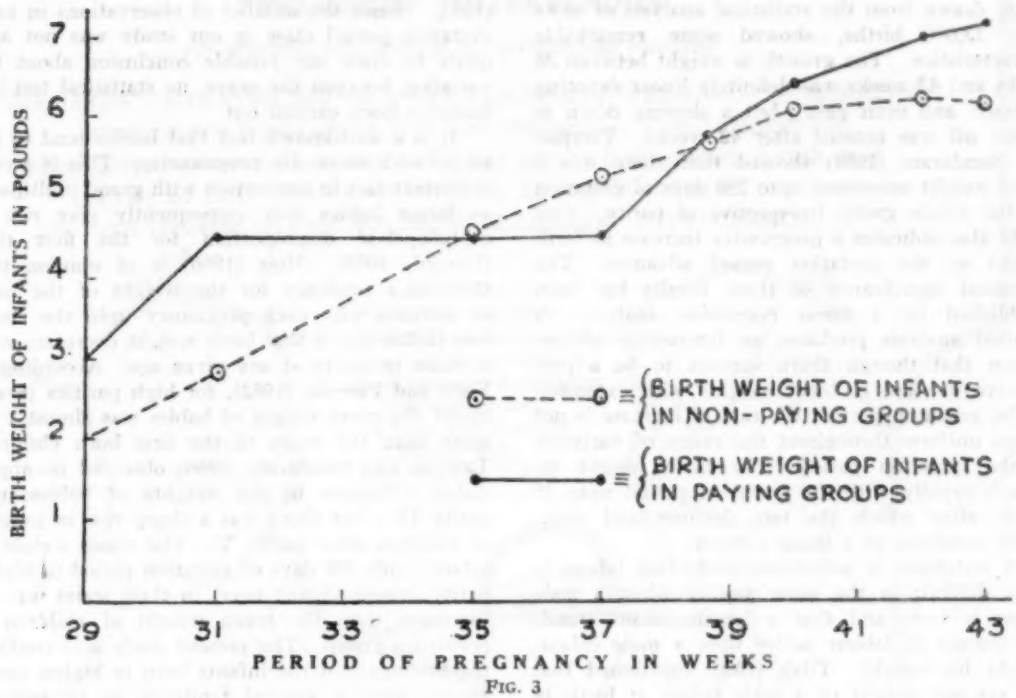

FIG. 3

birth weights of babies due to the difference in the socio-economic level of mothers. The result is summarised in Table 8.

The analysis of birth weights by gestation periods separately for the two economic groups considered above reveals more or less the same pattern of relationship as has been observed in Table 1B. The average birth weights over all gestation periods were 6·38 lb. and 5·85 lb. for the paying and non-paying groups respectively. In general, it was noticed that the birth weights of babies pertaining to mothers in the paying group were consistently higher than their counterparts for all periods of pregnancy. It was further observed that the significant difference in the overall mean birth weights of two economic groups was due to the fact that a larger proportion of mothers in the non-paying wards had extremely low gestation period which had contributed in no small measure to the reduction of the average birth weights of their babies to a significant extent. The result is also graphically represented in Fig. 3.

DISCUSSION

It is an accepted fact that the duration of pregnancy greatly influences the birth weight of infants. So the determination of the duration of pregnancy is a very important consideration in the study of birth weight of infants. The problem of the exact duration of human pregnancy has exercised the minds of obstetricians for generations and we are still not in a position of being able to give a complete answer. This is due to a large number of variable factors. There is not even a single universally accepted definition. The usual method of calculation is based upon the date of the last menstrual period. According to simple Naegele's rule, which is almost universally employed, seven days are added to the first day of the last menstrual period and nine months added in order to arrive at the expected date of delivery. This standard procedure was followed in the present study in the calculation of the gestation period, as in the present state of our knowledge, we cannot get nearer to the true date of expected delivery than that given by the application of Naegele's rule. The present study revealed that majority of the patients delivered sometime between 39 and 41 weeks of gestation. Tampan and Sundaram (1956) found that the maximum number of deliveries occurred between 271 and 276 days of gestation which showed a mean difference of 6·5 days of 280 days.

Karn and Penrose (1951) made an extensive study on the subject of foetal weight gain. A

graph drawn from the statistical analysis of more than 13,000 births, showed some remarkable characteristics. The growth in weight between 36 weeks and 42 weeks was definitely linear denoting a steady and even gain ; but a slowing down to almost nil was noticed after 42 weeks. Tampan and Sundaram (1956) showed that there was a linear weight increment upto 286 days of gestation for the whole group irrespective of parity. Our study also indicates a progressive increase in birth weight as the gestation period advances. The statistical significance of these results has been established by a linear regression analysis. A detailed analysis produces an interesting phenomenon that though there appears to be a progressive increase in birth weights with extension of the gestation period, the rate of increase is not aways uniform throughout the range of variation of the gestation period. The birth weight increases rapidly with the gestation period upto 35 weeks after which the rate declines and eventually conforms to a linear pattern.

A statement is sometimes made that labour is more difficult in the same mother when a male infant is born and that a female infant stands the trauma of labour better than a male infant, weight for weight. Tilak (1956) mentioned that the average weight of a male infant at birth in his survey was 5 lb. 14·9 oz. and of a female infant was 5 lb. 9·8 oz. Thus a female infant was on an average less in weight by 5·1 oz. at birth. Tampan and Sundaram (1956) found that in the group of primiparae the maximum number of female infants were born in 276 days of gestation and male infants in 271 days of gestation. The average birth weight of female infants was 6·49 lb. and of male infants 6·54 lb. and thus the average birth weight of male infants was slightly more than the average birth weight of female infants, which being only 0·05 lb. was not significant. Bhonsale (1956) noticed no appreciable difference in weight in male and female infants in 6 and 7 lb. groups. In the total of 700 infants the male infants exceeded in weight that of the female infants by 124. The maximum number of births irrespective of sex occurred in 39-41 weeks gestation period group of the present series. The mean birth weight of male infants was 6·01 lb. and that of female infants was 5·91 lb. From the present analysis it is noticed that though for the lower gestation periods male infants are slightly handicapped in respect of birth weights than that of the corresponding averages of female infants, they seem to gain more weight than the female counterparts when the gestation period exceeds the level of 38 weeks. A more or less similar observation has been made by Karn and Penrose (1951). Since the number of observations in each gestation period class in our study was not adequate to draw any reliable conclusion about the variation between the sexes, no statistical test has however been carried out.

It is a well-known fact that babies tend to get larger with successive pregnancies. This is a very important fact in connection with grand multiparae as larger babies may consequently give rise to cephalopelvic disproportion for the first time (Donald, 1955). Moir (1956) is of opinion that there is a tendency for the weight of the baby to increase with each pregnancy upto the sixth. Sen (1953) shows that birth weight decreases with increase in parity at any given age. According to Karn and Penrose (1952), for high parities (8 and more) the mean weight of babies was almost 1 lb. more than the mean of the first born children. Tampan and Sundaram (1956) observed no appreciable difference in the weights of babies upto parity IV ; but there was a sharp rise in weights of children after parity V. The mean weight of infants with 276 days of gestation period in higher parity groups (5 and over) in their series was 0·8 lb. more than the mean weight of children in primipara group. The present study also confirms the findings that the infants born in higher parity groups have a general tendency to be heavier. The average birth weight was minimum, i.e., 5·67 lb. in parity I group and was maximum of 6·36 lb. in parity VIII group. This was also noticed during the present investigation. There was a tendency for the average birth weight to increase systematically with parity upto the fourth order, but the pattern of variation among higher parities was not systematic.

It has been observed that the birth weight increases with the increase of age of the mother. Sen (1953) found a relation between the birth weight and age and parity of the mother and he concluded that the effect of maternal age on birth weight was small, but birth weight decreased with increase in parity at any given age. While studying a group of primiparae only, Tampan and Sundaram (1956) noticed that the birth weight did not show great variation upto the age of 27 years, but the same presented a gradual increase in the age group of 28 years and over. They found that infants in the higher age group were 0·43 lb. heavier than infants in the younger age group. They thought that this increase in birth weight was responsible for the greater incidence of instrumental deliveries in elderly primigravidae. The present study reveals that the minimum average birth weight is 5·50 lb. which is seen in 14-18 years age group and the maximum mean weight of 6·23 lb. is seen in 21-25 years age group. There

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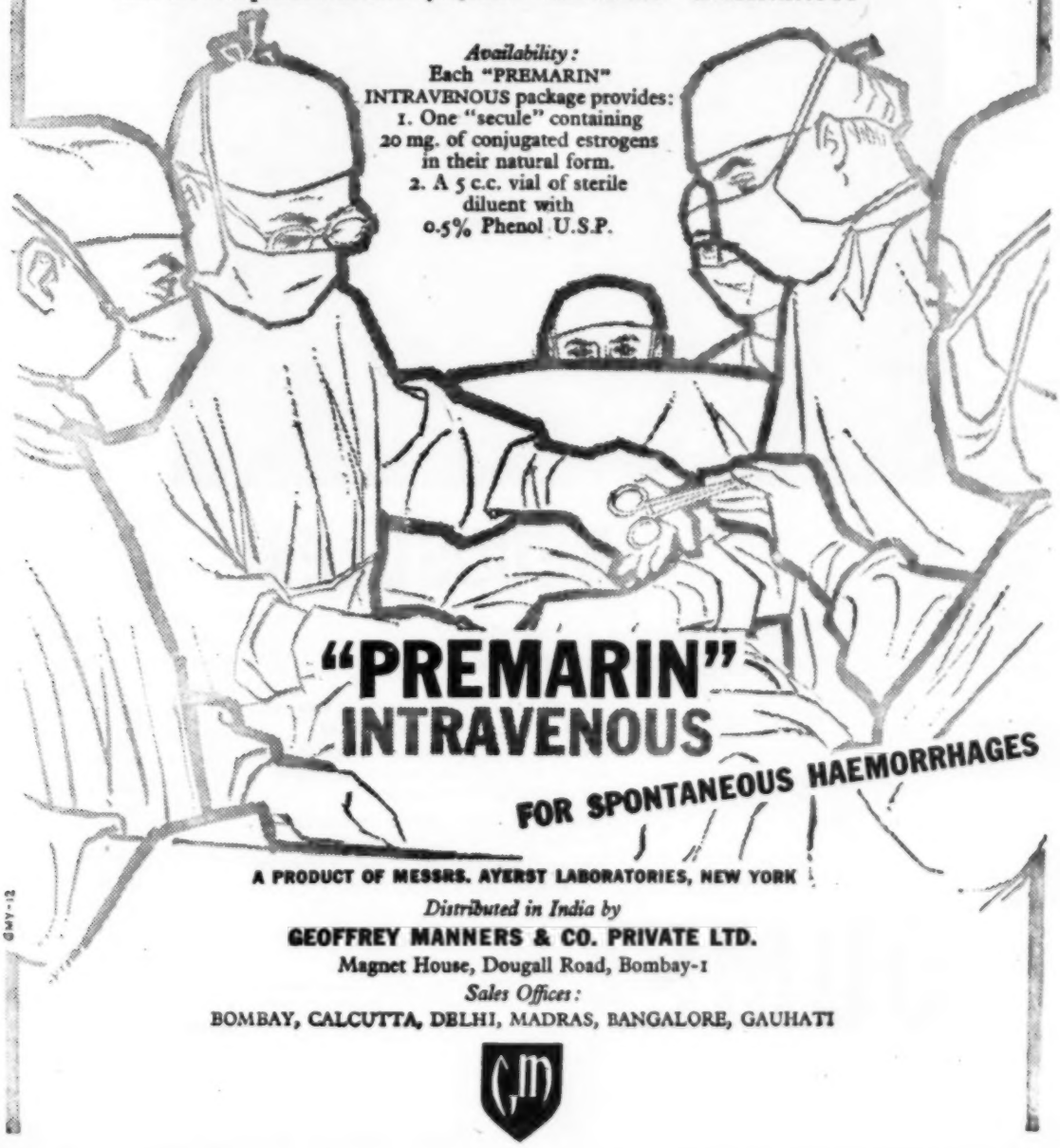

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appears to be a tendency for the birth weight to increase systematically with age upto 25 years, but it tends to diminish with advancing age thereafter. There is also a systematic tendency for the birth weights to gain upto the age of 30 years in respect of age among primiparae cases only. But subsequently the birth weights record a fall though no definite conclusion can be drawn in view of the fact that the number of observations in the age group 30 and above is inadequate. Our investigation also points out that though there is a distinct pattern of variations of birth weights with advancing age of the mother, the effect of parity on birth weights seems to be negligible when the analysis is restricted to the first three parities only. Further tests reveal that age affects birth weights significantly whereas the effect of gravida is practically negligible, and the pattern of variation of birth weights with respect to age is more or less the same for different parities.

The influence of socio-economic status on the birth weight of infants is a long recognised fact. The growth of an intra-uterine foetus largely depends on the mother's physique, health, habits and diet, all of which partly or wholly depend on the income and standard of living. Burk (1956) quoted by Bhonsale (1956) found close relationship between the diet and the birth weight. The importance of dietary and economic influences on prematurity and birth weight was also stressed by Edwards (1946). Sufficient nutrition prevents premature termination of pregnancy and thereby influences the birth weight. This had been corroborated by the study of Population Investigation Committee formed under the auspices of the Royal College of Obstetricians and Gynaecologists (1948). Douglas (1950) stated that a significantly low incidence of premature births was found among the most prosperous of the social classes. Sen (1953) found that the percentage of mothers receiving antenatal supervision was highest in the upper income group and he considered this to be a contributory factor towards higher birth weight as met with in them. He concluded that the birth weight was greatly influenced by the nutritional status, particularly, during the last three months of pregnancy. Bhonsale (1956) studied the effect of diet supplements on birth weight, length, etc. She observed that the weight of maximum number of infants of experimental group was 7 lb. as compared to 6 lb. in the control group. In the present study, we did split our patients into two broad groups according to socio-economic status with a view to find out the relationship of the latter with the birth weight. In general, it was noticed that the birth weights of upper income group were consistently higher than those of lower income group for all periods of pregnancy. The significant difference in the over-all mean of birth weights of the two economic groups is due to the fact that a high percentage of mothers of lower income group had experienced premature termination of pregnancy. The importance of routine and regular antenatal supervision of prospective mothers cannot be over-emphasised. During antenatal supervision, a pregnant woman becomes conscious of the importance of nutrition and this is the beneficial effect of this care on birth weight of infants

Summary

Birth weight increases systematically with advancing gestation period, but more rapidly in the initial phase, i.e., below 35 weeks.

For earlier gestation periods the birth weights of female babies are slightly higher than that of their male counterparts, whereas the reverse conclusion is true in cases with gestation period of 38 weeks or more.

The parity when considered alone has no appreciable effect on birth weight.

The birth weight systematically increases upto 25-30 years age group, and thereafter diminishes consistently. The increase in birth weight with parities observed among the first 3 para may be due to the coincidence of higher parities with higher ages.

The lower economic group of patients has recorded a lower over-all average birth weight, mainly for the reason that the larger proportion of births to this group was premature. Besides gestation periods, there appear to be other factors which bring down the mean birth weight among lower economic group patients. This is brought out by comparisons of the average birth weights of the upper economic group in similar gestation period class.

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THERAPEUTIC RESPONSE TO A NEWER ANTIMALARIAL, 377-C-54

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Studies on the effect of 377-C-54, a naphthalene derivative against avian and simian malaria show that the drug possesses high degree of activity against blood-induced avian and simian plasmodia (Sen Gupta *et al*, 1958*a*, 1958*b*). Preliminary investigations against human malaria as reported by Bruce-Chwatt and Charles (1957) would indicate that the activity is somewhat comparable to the 4-aminoquinoline.

The present report records the observations on a large scale investigation carried out to determine the efficacy of the same drug against human malaria both under rural and hospital conditions.

MATERIALS AND METHODS

A total of 124 cases, 70 with *P. vivax* and 54 with *P. falciparum* were treated, 22 in the Delhi Police Hospital and 102 in certain rural areas in the district of Bulandshehar, U.P., where Malaria Control Programme had not been taken up at the time the drug was administered by domiciliary visits to all cases which showed overt malaria.

Thick and thin blood smears were stained with J.S.B. (Jaswant Singh and Bhattacharya, 1944 : Jaswant Singh, Ray and Nair, 1953) and cases were categorised according to the species of plasmodia detected. At least 100 fields (oil-immersion lens) of the thick film were examined before submitting a negative report.

The dosage schedules adopted were as follows :

(*a*) A dose of 200 mg. administered twice on the first day and once on the second day, i.e., a total of 600 mg. (Schedule I).

(*b*) A single dose of 400 mg. (Schedule II).

(*c*) A single dose of 600 mg. (Schedule III).

The dosage schedule followed in the hospital was as per (*a*) above, and those under rural conditions were as per (*b*) and (*c*).

The main criterion of activity was the speed of clearance of asexual forms of the plasmodia from the peripheral circulation. As the rural areas were widely scattered with difficult communication, no attempt was made to record the temperature. However, blood smears were collected daily to determine the rate of clearance of asexual parasites. Records of temperature were kept of the patients treated in the hospital. Besides, observations were also made on the rate of clearance of gametocytes.

RESULTS AND OBSERVATIONS

For convenience the results of trials have been presented separately under hospital and rural conditions (Tables 1 and 2 respectively). The effect of the drug on the gametocytes has been shown in Table 3 where both the categories (hospital and rural) have been included.

From the therapeutic response to the divided dosage schedule of the drug in hospital patients, it was noted that 92·3 per cent of *P. vivax* cases became afebrile within 48 hours. However, it was only after 72 hours that relief of clinical symptoms could be recorded in 100 per cent of cases (Table 1). Further, the response to the drug in *P. falciparum* infection was observed to be still more tardy. Only 55·5 per cent of cases became afebrile within 48 hours and 77·7 per cent within 96 hours. In the rest of the cases such relief was observed as late as the 5th day. The rate of parasite clearance seemed to follow somewhat similar pattern. Although parasite clearance was recorded in 100 per cent of *P. vivax* cases within 48 hours, in *P. falciparum* infection during the same period, such clearance was observed only in 55·5 per cent and it was not till after 96 hours that parasite clearance could be observed in 100 per cent of cases.

The rate of asexual parasite clearance under schedules II and III has been indicated in Table 2. It was observed that under the single dosage

TABLE 1—SHOWING THE RATE OF CLEARANCE OF ASEXUAL FORMS AND RELIEF OF CLINICAL SYMPTOMS (IN HOURS) IN CASES TREATED AT POLICE HOSPITAL, DELHI

Figures in parentheses indicate percentage.

Regime	Type of infection	Total cases	Parasite clearance within hours					Temperature clearance in hours				
			24	48	72	96	120 or over	24	48	72	96	120 or over
377-C-54												
600 mg. in three divided doses of 200 mg. each at interval of 12 hours	*P. vivax*	13	9 (69·3)	4 (100)	—	—	—	4 (30·8)	8 (92·3)	—	1 (100)	—
	P. falciparum	9	3 (33·3)	2 (55·5)	1 (60·6)	1 (67·7)	2 (100)	4 (44·4)	1 (55·5)	1 (66·6)	1 (77·7)	2 (100)

TABLE 2—SHOWING RATE OF ASEXUAL PARASITE CLEARANCE WITH 377-C-54 UNDER DIFFERENT DOSAGE SCHEDULES IN CASES TREATED BY DOMICILIARY VISITS IN RURAL AREAS

Figures in parentheses indicate percentage.

Schedule No.	Dosage schedules	Type of infection	No. of cases treated	Clearance within hours				
				24	48	72	96	96 or over
II	400 mg. single dose	*P. vivax*	18	11 (61·1)	6 (94·4)	—	1 (100)	—
		P. falciparum	17	8 (47·1)	3 (64·7)	3 (82·3)	—	3
III	600 mg. single dose	*P. vivax*	39	31 (79·4)	7 (97·4)	1 (100)	—	—
		P. falciparum	28	19 (67·5)	9 (100)	—	—	—

TABLE 3—SHOWING RATE OF GAMETOCYTE CLEARANCE WITH 377-C-54 IN CASES TREATED IN HOSPITAL (SCHEDULE I) AND IN RURAL AREAS BY DOMICILIARY VISITS (SCHEDULES II AND III)

Figures in parentheses indicate percentage.

Schedule No.	Dosage schedules	Types of infection	No. of cases treated	Clearance within hours				
				24	48	72	96	96 or over
I.	200 mg. twice daily total 600 mg. in 1½ days	*P. vivax*	9	—	5 (55·5)	3 (88·8)	1(100)	—
		P. falciparum	1	—	—	—	—	1
II	400 mg. single dose	*P. vivax*	12	1 (8·3)	6 (50)	3 (75)	1 (83·3)	1
		P. falciparum	15	—	3 (20)	—	2 (33·3)	10
III	600 mg. single dose	*P. vivax*	22	7 (31·8)	8 (68·8)	4 (86·3)	3(100)	—
		P. falciparum	16	1 (6·2)	3 (25)	2 (37·5)	1 (43·7)	9

N.B.—Out of 124 cases only 75 cases showed gametocytes at the initial stage.

schedule of 400 mg., clearance of asexual forms of *P. vivax* were recorded in 61·1 per cent within 24 hours, 94·4 per cent within 48 hours. Here again it was not till 72 hours had elapsed before clearance was attained in 100 per cent of cases. In *P. falciparum infection* such clearance was attained in 64·7 per cent within 48 hours and 82·3 per cent within 72 hours. Disappearance of parasites from the peripheral circulation in the rest of the cases was observed only after 96 hours.

However, under the higher dosage schedule of 600 mg. the response appeared to be remarkably prompt. Within 48 hours parasite clearance was evident in 97·4 per cent cases of *P. vivax* and in 100 per cent within 72 hours. The findings were still more interesting in *P. falciparum* infection in that the rings had disappeared in 67·5 per cent cases within 24 hours and in 100 per cent of cases within 48 hours.

The rate of clearance of gametocytes has been shown in Table 3, from which it is evident that in *P. vivax* infection such clearance was attained in 50 to 68·8 per cent within 48 hours under all the three dosage schedules and that the best result was attributable to the highest dose. The clearance rate was observed to be between 75 and 88·8 per cent within 72 hours and in 100 per cent of cases within 96 hours under Schedule I and III. Compared to these results the action against the crescents was observed to be extremely tardy even with the highest dosage schedules under which it was noted that in 43·7 per cent cases only, complete clearance was attained within 96 hours. In the rest of the cases gametocytes were continued to be observed even beyond that period.

None of the cases were followed up after the present observation on account of certain inherent difficulties. As such it was not possible to study the relapse rate.

The drug seemed to be well tolerated.

Discussion

Therapeutic response of 377-C-54, a naphthalene derivative, was observed to be variable in different plasmodia. Working with a strain of *P. gallinaceum* in chicks, Sen Gupta *et al* (1958*a*,*b*) reported that the drug was comparatively slow in action and the M.E.D. was as high as 0·65 mg. per 50 g. chick. On the other hand, it seemed to have much more powerful action against a highly virulent strain (Nuri) of *P. knowlesi*.

Preliminary observations on field trials conducted in Nigeria showed that the drug had a pronounced schizonticidal effect against all the three common human plasmodia and that it was well tolerated. Further, it was reported that under single dosage schedules like, 100, 200 or 300 mg. the action of the drug was not so complete as that of the 4-aminoquinolines (Bruce-Chwatt and Charles, 1957).

From the results of observations made during the present investigations it was evident that under Schedule I (600 mg. in three divided doses), relief of clinical symptoms in *P. vivax* was attained in most cases within 48 hours and in this respect the action would seem to be comparable to that of chloroquine even though at least in one case fever persisted beyond 72 hours. However, in *P. falciparum* infection the response to the drug was somewhat slower and at least a third of the cases continued to have fever beyond clearance within 72 hours which is generally accepted to be the maximum time limit which should be allowed to judge the reliability of any antimalarial drug and as such the particular dosage schedule of 377-C-54 would appear to be unsuitable in falciparum malaria.

The rate of parasite clearance was almost similar. The response to 400 mg. single dosage schedule was again somewhat better in *P. vivax* infection than observed in *P. falciparum* cases. However, on the other hand, the drug showed high degree of activity against both *P. vivax* and *P. falciparum* under the single dosage schedule of 600 mg. The rate of clearance in *P. falciparum* was extremely rapid in that within a period of 48 hours asexual parasite clearance was observed in 100 per cent cases. In *P. vivax* infection such clearance was recorded to be within 72 hours though in 97·4 per cent it was within 48 hours.

It would, therefore, be obvious that in the first two dosage schedules (600 mg. in three divided doses and 400 mg. single dose) the rate of clearance was somewhat slower in *P. vivax* infection as compared to the single dosage schedule of 600 mg. In *P. falciparum* infection the response to the first two schedules was definitely tardy and perhaps not quite dependable particularly in heavy infection. However, the single dosage schedule of 600 mg. appeared to be highly effective and the response was similar to that observed in respect of 4-aminoquinolines.

Under the same dosage schedule, Chaudhuri *et al* (1950) reported a fair measure of success with a dose of 500 mg. of chloroquine in *P. vivax* infection but the result was not quite so spectacular in *P. falciparum* infection. Subsequently, Hoekenga (1952) demonstrated that while in *P. vivax* infection the therapeutic response to 450 or 600 mg. of chloroquine administered as a single dose was somewhat similar and quite effective, such response in *P. falciparum* cases was much faster under the latter regime. Jaswant Singh, Ray and

Misra (1953) also made very similar observations. Subsequently, Ray *et al* (1956) had reported that the best results were observed in all types of infection with a single dose of 600 mg. than the lower dosage schedules of 400 or 450 mg. of the 4-aminoquinolines. They had also pointed out the significance of the rate of clearance of parasites and clinical symptoms within 48 and 72 hours and accordingly recommended that under Indian conditions the optimum dose of the 4-aminoquinolines which should be adhered to was 600 mg. even though many cases of *P. vivax* might show prompt response in lower doses.

Thus in view of these observations, it would appear that therapeutic response to chloroquine or 377-C-54 in 600 mg. single dosage schedule was almost identical.

But, on the other hand, the drug seemed to act extremely slowly against the gametocytes and this was particularly apparent in *P. falciparum* infection. Similar tardy response was reported earlier by Bruce-Chwatt and Charles (*loc. cit*) as well though the dosage schedules adopted by them were somewhat lower.

The drug was well tolerated and as such a single dose of 600 mg. was considered to be safe enough.

Summary

A series of 22 hospital cases was treated with a dose of 600 mg. in 3 divided doses. The response in both *P. vivax* and *P. falciparum* infection appeared to be slow and more so in the latter. The same was observed with a single dose of 400 mg. in respect of the 35 cases treated in rural areas. The reaction in *P. falciparum* cases appeared to be particularly tardy.

However, parasite clearance in both *P. vivax* and *P. falciparum* infection was remarkably prompt with a dose of 600 mg. administered only once as was observed in 67 cases treated in the rural areas by domiciliary visits. The response was very similar to 4-aminoquinolines under the same dosage schedule. The drug was well tolerated.

The drug proved to be extremely slow against the gametocytes.

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HUNTINGTON'S CHOREA

A Biochemical Study

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Holmberg and Laurel (1947) isolated a blue copper-globulin complex from porcine and human blood and gave it the name of ceruloplasmin. They considered it to be an alpha globulin. Other workers have confirmed these findings and have also shown that ceruloplasmin was absent or very greatly reduced in hepato-lenticular degeneration (Wilson's disease) whereas urinary copper excretion was found to be increased.

Uzman and Denny-Brown (1948) reported amino-aciduria in Wilson's disease and suggested an underlying inborn error of metabolism to be present not only in this disease but probably also in Huntington's chorea and presenile dementias.

A study of copper metabolism and the liver thus appeared to be of interest in Huntington's chorea and this paper records the findings of such a study in two brothers suffering from the disease.

Cummings *et al* (1955) estimated blood copper levels in 10 normal persons. The values varied between 90 and 180 micrograms with an average of 132·7 micrograms per 100 c.c. of blood. Using

the technique advocated by Cartwright *et al* (1945) blood copper was estimated by one of us (H.L.C.) in 12 normal persons obtaining a range of 80-126 micrograms per 100 c.c. of blood with a mean of 109·54 micrograms ($\sigma = 13·03$). Urinary excretion of copper in 24 hours estimated by Earl's (1954) technique varied between 18 and 25 micrograms with an average of 21·1 micrograms ($\sigma = 2·92$).

Case Reports

Case 1—S. S., 30, male, was a typical case of Huntington's chorea of 2 years' duration. Routine laboratory tests on blood, urine and stools were normal. Liver function tests, serum electrophoretic study and aminoacid excretion in the urine were within normal limits. Blood copper was 111 micrograms per cent. Urinary copper excretion in 24 hours was 383 micrograms on 2-2-1957, 327 micrograms on 6-3-1957 and 393·7 micrograms on 6-4-1957. Cerebrospinal fluid did not reveal any abnormality. Liver biopsy showed normal appearances. Histochemical demonstration of copper by Mallory's technique on liver biopsy did not reveal excessive deposits of copper in the liver.

Case 2—S. S., 25, male, was showing classical features of Huntington's chorea. Routine laboratory tests on blood, urine and stools were normal. Liver function tests, serum electrophoretic study, aminoacid excretion in the urine and cerebrospinal fluid findings were within normal limits. Blood copper was 160 micrograms per cent. Urinary copper excretion over 24 hours was 25 micrograms on 2-2-1957, 20·1 micrograms on 6-3-1957 and 73·5 micrograms on 6-4-1957. Liver biopsy showed normal liver histology. Histochemical demonstration of copper on a piece removed by liver biopsy did not show excessive deposits of copper in the liver.

Discussion

These two brothers suffering from Huntington's chorea have already been reported (Chhuttani, 1957). Liver functions, its copper content and histology were normal. The blood copper values were within normal limits but urinary excretion of copper in the elder brother was consistently high. Holmberg and Laurel (*loc. cit.*) suggest that in Wilson's disease ceruloplasmin may be decreased giving rise to excessive excretion of copper in the urine. Uzman *et al* (1956) explain the increased urinary copper excretion (in this disease) on the basis of a decrease of particular fractions of globulin which bind copper in the ionic form in blood. However, no cogent explanation can be offered at present for the isolated chance finding of a raised urinary copper excretion since the blood copper level was normal and the liver did not show any abnormal deposits of copper.

Summary

A study of copper metabolism in two brothers suffering from Huntington's chorea revealed one to be having a persistently high excretion of copper in the urine.

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RESERPINE IN HUNTINGTON'S CHOREA

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AND

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Reserpine has been reported to produce immobility of parkinsonism during its use in psychotic patients (Shuman, 1955 ; Stanley, 1955 ; Wakerlin, 1955). The use of this drug has been advocated in the treatment of hyperkinetic syndromes in high dosage on the basis of this toxic effect. Trelles (1955) using a purified extract of reserpine carried out a therapeutic trial in 7 patients with choreo-athetotic movements, 4 with paralysis agitans, 2 with chorea (rheumatic and Huntington's), 2 with 'infantile encephalopathy' (one with hemiballic movements) and one with a cephalic tremor. Reserpine was regarded by this worker to be a valuable drug in the treatment of hyperkinetic syndromes and gave better results than those obtained by any other medical procedure. All the patients, except those with paralysis agitans, showed a marked diminution of their extrapyramidal movements, but the relief of dyskinesia was observed only as long as the drug was given. The younger the patient the more impressive were the results. A fair but temporary remission of hyperkinetic manifestations was obtained with relatively small doses of the drug in patients whose disease was of short duration but in chronic or congenital cases large doses given over a prolonged period were needed to

achieve the same results. On the average, a favourable response was obtained with doses ranging from 3 to 4 mg. daily ; the clinical response to the drug occurred after a latent period, which varied from 4 to 15 days.

A therapeutic trial of reserpine in three patients suffering from classical Huntington's chorea is the subject of this report. Although the disease is not uncommon in the Punjab (Chhuttani, 1957), it has not been possible to conduct a controlled trial in a bigger number of patients.

Case Reports

Case 1—S. S., male, 30 years, who had been suffering for two and a half years' was given 1 mg. of 'serpasil' thrice daily intramuscularly along with 4 tablets of 0·25 mg. each orally every day for a total of 9 days. On the third day of administration of the drug he started complaining of 'high fever' while the temperature record was quite normal. He also had disturbed sleep. On the fifth day he began to talk incoherently and was excited. Two days later, however, the complaint of 'fever' subsided and subjectively he felt somewhat improved but objectively the movements were undiminished and since he appeared to have deteriorated mentally the trial was not continued.

Case 2—S. S., male, 20 years, brother of the first case suffering for two years was put on serpasil (1·25 mg.) four times daily by mouth (a total of 5 mg. daily) for a period of seven days, after which he refused to take the drug and left the hospital against medical advice. On the third day of treatment he developed diarrhoea and the drug had to be omitted for 36 hours. There was no improvement at all after 7 days of therapy.

Case 3—J. P. S., aged 52 years, another typical case with a positive family history over many generations was prescribed reserpine in high dosage but he actually took only 1·25 mg. daily for a period of five weeks. No improvement was noted.

The dosage of reserpine in the third patient could not be pushed to the level similar to that as in the first two, yet in no one was there a semblance of an improvement.

Comments

Treatment of Huntington's chorea remains a hopeless task. Goldman (1952) reported that oral procainamide had given beneficial results in the control of choreiform movements. But Playdell (1954) treated six patients showing gross movements with increasing doses of procainamide over a period of more than six weeks and no beneficial effect atributable to the drug was seen.

Summary

A therapeutic trial of reserpine carried out in three patients of Huntington's chorea showed no subjective or demonstrable improvement in either the involutary movements or the mental state.

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CORTICOSTEROIDS IN THE MANAGEMENT OF TUBERCULOUS LYMPHADENITIS

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The management of tuberculous lymphadenitis has always been a perplexing problem. Ultraviolet rays, deep ray therapy, non-specific protein shock therapy, tuberculin therapy, sodium salicylate injections, block dissection of the glands and other procedures have been tried with encouraging results. Recent introduction of chemotherapy has resulted in the exclusion of almost all the above mentioned procedures with certain exceptions. However, it has been realised that some cases may fail to respond to chemotherapy or the response may be fairly delayed. In such cases addition of corticosteroids has been known to hasten the resolution of the glands (Hardy, 1956 ; Harris, 1957 and Chatterjee *et al*, 1958).

We have, in our hospital, treated 6 cases of tuberculous lymphadenitis successfully by administration of 5 mg. of prednisolone per day along with the usual chemotherapy. Three of these cases are reported here.

Case Reports

Case 1—R.K., a boy, aged 12 years, attended our O.P.D. in September, 1958 complaining of enlarged masses of glands on both sides of the neck, with multiple sinuses. The clinical diagnosis made was that of tuberculous lymphadenitis. The child was put on streptomycin ½ gram I.M. and INH 200 mg. a day. Treatment for 1 month, however, did not reveal a material difference in the clinical condition of the patient. Then prednisolone in doses of 5 mg./day was added to the same chemotherapeutic regimen. Within 2 weeks the sinuses started healing and within 1 month they healed completely and the glands regressed remarkably. Prednisolone was then gradually withdrawn.

Case 2—Miss K.D., aged 18 years, was admitted to our hospital on 6-9-58. She had an exudative focus in her right lung with generalised lymphadenitis. There were big masses of glands in the right axilla, which caused neuralgic pain in her right arm occasionally. The patient was diagnosed to be suffering from tuberculous lymphadenitis in association with pulmonary tuberculosis. She was put on streptomycin 1 g. I.M. and INH 200 mg. a day. The treatment was continued for 1 month without any reduction in the size of the glands. Prednisolone was then added in doses of 5 mg. a day. Within 3 weeks there was marked resolution of the glands. Her pulmonary condition also showed some improvement.

Case 3—Mrs. S., aged 20 years, housewife, was admitted to our hospital on 21-8-58. She had enlarged matted glands in her neck and axilla and exudative foci in both the lungs. She was put on streptomycin and INH in usual doses, but failed to respond. However addition of 5 mg. of prednisolone per day resulted in a rapid resolution of the glands.

Discussion

Corticosteroids along with usual chemotherapy have been used with great success in various forms of tuberculosis. The beneficial effects obtained by corticosteroids in these conditions have been attributed by Mcleod Riggins (1957) to its anti-inflammatory, anti-allergenic and therapeutic effects. However, one must realise that these physiological effects of corticosteroids will only be exhibited if the drug is given in such doses as to attain a therapeutically effective blood level. Such blood levels besides their desirable beneficial effects are not entirely innocent.

A significant part of our observation is that we have used as low a dose as 5 mg. per day of prednisolone in our cases. Earlier Tandon *et al* (1957) reported 9 preterminal cases in some of whom 5 mg. per day of cortisone was used with success. Chatterjee *et al* (1958) have reported 4 gravely ill cases in whom 1 to 2½ mg. of prednisolone per day was used with great success. One of their cases was also suffering from tuberculous lymphadenitis.

Tandon and Narang (1958) have reported the depression of the adrenocortical functions in tuberculosis in direct relation to the severity of the disease. Clarke *et al* (1954) have also reported similar findings. Kass *et al* (1955) reported that the resistance in tuberculosis was directly associated with an increment in the elaboration of corticosterone by the adrenals. Small doses of cortisone have been found to have an anabolic action on the protien, as opposed to the catabolic effects exerted by larger doses, of the hormone. Keeping all the abovementioned observations in view it appears plausible for us to assume that corticosteroids in such low doses actually act as a replacement therapy in tuberculosis and exert their beneficial effect by enhancing the host resistance. Safety of such small doses of the drug needs no comment.

Summary

Three cases of tuberculous lymphadenitis treated with streptomycin, INH and prednisolone have been presented.

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SPECIAL ARTICLE

GASTROSCOPY

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Introduction

INSTRUMENT :

The instrument that has been found most satisfactory is the rigid-flexible photogastroscope. This gastroscope facilitates observation, suction, inflation, deflation, colour photography and biopsy. Essentially it consists of a double-walled outer tube 70 cm. long and 13 mm. wide. The distal 16 cm. is flexible and it ends below in a double filament bulb. One filament of the bulb is used for observation and the other for photography. Just above the bulb on its socket is a window through which all the manoeuvres are carried out. In principle it is the same as the Negus Broyle bronchoscope used in this department, as the same types of telescopes giving angular vision are used in both. But unlike the bronchoscope direct vision is not possible in this gastroscope as the lower end is blocked by the bulb socket. The flexible por-

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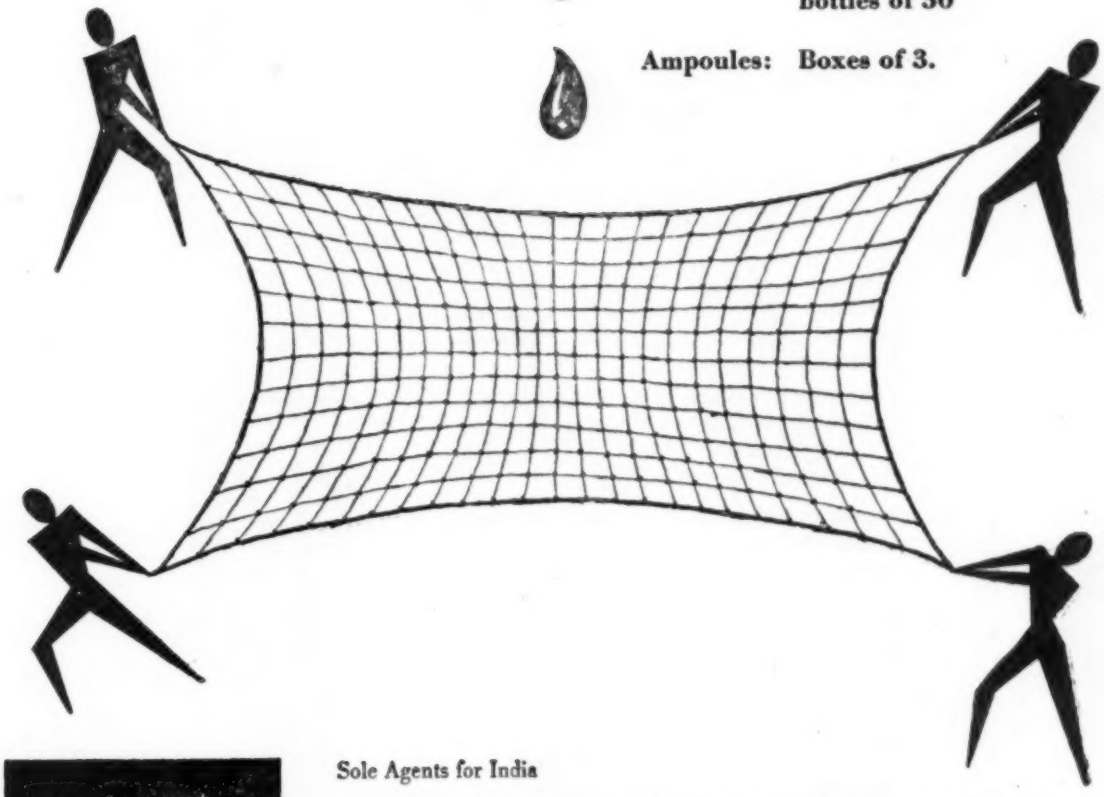

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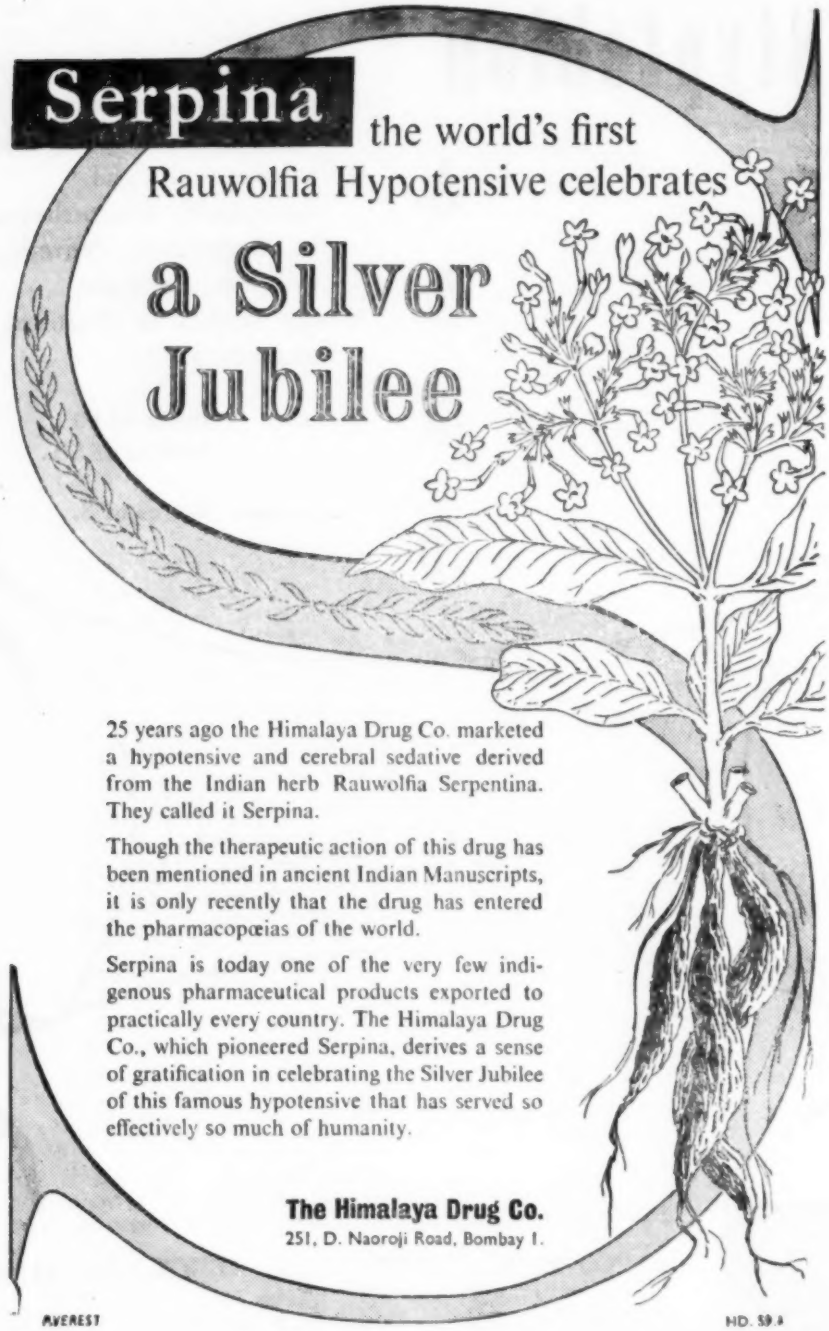
Serpina the world's first Rauwolfia Hypotensive celebrates a Silver Jubilee



25 years ago the Himalaya Drug Co. marketed a hypotensive and cerebral sedative derived from the Indian herb Rauwolfia Serpentina. They called it Serpina.

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tion helps safe negotiation of the lower thoracic vertebral convexity during insinuation and withdrawal. Unlike other gastroscopes this operates while rigid and straight. Incorporated in the wall and running along the entire length of the outer tube are two electrical conductors and the inflation tube. One of the conductors is in contact with the observation filament of the bulb and the other with the photofilament. All the three of these end proximally in their respective nipples. At the outer end is a screw with a rubber washer which holds air-tight the various instruments introduced into the outer tube.

Telescopes which are rigid and straight and 70 cm. long giving vision at 60, 90 and 135 degrees are introduced one after the other, depending on the area to be explored. The objectives of the telescopes remain locked opposite the window on the bulb socket. The outer tube and the telescope are then pushed down slowly and rotated as required.

Suction tube 70 cm. long with a curved rubber catheter at the lower end is introduced from time to time to remove the secretion.

Biopsy equipment consists of a telescope 70 cm. long giving vision at 110 degrees with a channel along its entire length. This channel ends below in a small lever which is raised or lowered by operating a screw at the upper end. Biopsy forceps 80 cm. long has two tiny jaws at the end of the flexible cable. Biopsy telescope the objective of which gets locked opposite the window on the bulb socket is first introduced. The forceps is made to run along the channel over the small lever, through the window into the cavity of the stomach. Length of the forceps is adjusted by pushing it in and out, flexion by the lever and direction by rotating. I have succeeded in introducing the biopsy forceps after tying two separate knots a little above the jaws with two pieces of fine thread and producing flexion by pulling on the threads from outside.

Photo equipment consists of a transformer which is connected through a Robot camera to the photo nipple at the upper end of the outer tube. The photographs being small (14 × 14 mm.) it is preferable to take black and white and then enlarge.

STOMACH :

Anatomy—The stomach is a pear-shaped organ about 10 in. long and 5 in. wide with a capacity of 2 pints or 1000 c.c. air at moderate inflation and is placed in the abdomen with the broader end above and to the left, in the erect position. It is normally curved and bent upon itself like a sickle. It has two orifices, the cardiac and the pyloric, two surfaces, the anterior and the posterior, and two curvatures, the greater and the lesser. The pylorus is directed slightly upwards and backwards and is more or less fixed. The cardiac orifice is situated opposite the eleventh thoracic vertebra and the pyloric orifice to the right of the middle line at the level of the upper border of the first lumbar vertebra. The shape and size of this organ varies considerably with (a) position of the individual, (b) nature and quantity of the gastric contents, (c) changes in the nearby organs. On the lesser curvature nearer the pylorus is an angular depression called the incisura angularis. This divides the stomach into a left cardiac part and the right pyloric part. On the greater curvature of the pyloric part, the sulcus intermedius divides this portion into a proximal pyloric antrum and a distal pyloric canal.

Histology—The stomach wall consists of four layers, viz., serous, muscular, submucous and mucous. The serosal layer contains peritoneum, blood vessels and nerves. The muscular layer consists of an outer longitudinal, a middle circular and an inner oblique and incomplete layer. The submucous layer contains loose areolar tissue, a plexus of nerves, vessels and fat cells. The mucous layer consists of muscularis mucosa, tunica propria and columnar epithelium containing chief cells all over except over the pyloric part.

Physiology—The movements of the stomach are intrinsic and extrinsic. Intrinsic movements are extremely variable. Normally the waves of contraction start at about the incisura angularis which the gastroscopists call angulus, roughly at the rate of three a minute. The opening of the pylorus is also variable. The well-developed muscularis mucosa near the pylorus throws the mucosa of the region into radial folds, like the iris of the eye. Probably the pylorus opens when the intragastric and the intraduodenal pressures exceed the optimum. Reverse peristalsis is caused by mechanical irritation or mental irritation. Extrinsic movements are caused by respiration and pulsation of the heart and large blood vessels.

GASTROSCOPY

Technique—Preparation of the patient is the same as for other endoscopies. Patients must be fasting for at least 6 hours. Pentobarbitone 1½ grain is given by mouth two hours before and morphine sulph. 1/4 grain with atropine sulph. 1/100 grain an hour before the operation. The throat is sprayed with zylocaine (4 per cent) every 10 minutes three or four times till the patient complains of numbness.

It is necessary to humour the patient and to explain that the procedure is painless and harmless and thus obtain the maximum co-operation and relaxation. The patient lies on the table on the left side with the right shoulder above and the right hand hanging loose over the edge. Left side of the head rests on small pillows. Neck is kept straight and the head well extended so that the mouth, chin and the suprasternal notch are in the same plane. After checking the instruments once again, the lower end of the gastroscope is smeared with surgical jelly and introduced into the right pyriform sinus. A nurse pulls the tongue of the patient gently to the left. The instrument is swung first medially and posteriorly and then straightened. With studied patience and pressure, it would be easy to traverse the normal cricopharyngeal and hiatal constrictions. After entering the gastric cavity and after observing and aspirating the secretion, the telescopes are introduced to explore the different parts, with just sufficient air inflation. External manipulations which favour better visualisation include: (*a*) Moving the shoulders forwards and backwards and (b) Applying hot or cold water bags to the abdomen. Heat increases the peristalsis of the stomach and cold decreases it. If after studying the lesion it is thought necessary to photograph it, then the photographic unit is attached to the telescope and pictures are taken. For biopsy, the telescope is removed and the biopsy telescope and the forceps are introduced and bites taken from suspected sites. Bleeding, if fearful, could be controlled by ice water lavage of the stomach. After the examination is over, the gastroscope is gently withdrawn and the patient sent back to the ward with instruction not to swallow anything until numbness of the throat disappears.

Indications and Contraindications for Gastroscopy

Indications—While other endoscopic procedures are adopted for diagnosis as well as for therapy (dilatation, foreign body removal, cauterisation and therapeutic drainage), gastroscopy, except for the removal of very small foreign bodies, is helpful only for diagnosis. The following are the conditions:

(1) To assess the extent of gastritis in a preoperative stomach and to decide resection and its extent.

(2) In cases of gastric haemorrhage, just prior to operation to locate the lesion. Often, gastroscopy could be successfully done after ice water lavage of the stomach.

(3) In cases of oesophageal varices before adoption of the sclerosing treatment to estimate the gastric mucosal condition, although the oesophageal varices are submucosal and gastric varices are subserosal.

(4) In postirradiation gastritis to evaluate the damage.

(5) In duodenal ulcers to (a) understand the extent of gastritis due to pyloric obstruction, (b) eliminate tumour as the possible cause of pyloric obstruction, and (c) demonstrate complicating gastritis as the cause of therapeutic failures.

(6) In postoperative stomach with symptoms, to eliminate the presence of free suture, anastamotic ulcer or marginal ulcer. Also to notice the degree of rhythmic activity of the stoma.

(7) To differentiate benign from malignant ulcers, tumours, etc., first by the external appearance and then by biopsy.

(8) In cases of achlorhydria because of its association with precancerous and cancerous conditions, periodical biopsies may be necessary. Also in cases of histamine-fast achlorhydria, if the fundal mucosa is normal, pernicious anaemia can be ruled out.

(9) In sarcomas, the radiotherapist would require information on the histopathologic aspects of the tumour to decide the dosage.

(10) To estimate the progress in cases of chronic atrophic gastritis after substitution therapy.

(11) As the number of people in the older age group increases, gastroscopy could be adopted as a prophylactic measure in those having gastrointestinal symptoms.

(12) Of research value is to observe the action of the suspected allergen on the gastric mucosa.

Contraindications—(1) Haemorrhagic telangiectatic conditions of the lips and pharynx for fear of similar conditions existing in the oesophagus, which might cause bleeding. (2) Haemorrhagic diseases and portal hypertension. (3) Diseases of the oesophagus, cervical vertebrae, tracheobronchial tree and aorta. The presence of these would not permit the insinuation of the instrument. (4) Diseases of the heart—auricular fibrillation, myocarditis, massive enlargements. (5) Hyperthyroidism. (6) High fever and prostration. (7) Some types of psychosis.

Gastroscopic Appearance of the Normal Stomach

For gastroscopic purposes the stomach is divided into four parts, viz., fundus, pars media, pyloric antrum and pyloric canal. Fundus is that portion of the stomach lying on the left of a fully

introduced gastroscope and the pars media is that portion on the right up to the incisura angularis.

Normal gastric mucosa is smooth and orange red in colour except perhaps over the greater curvature of the antrum, where it is said to be orange grey. Close to the cardiac orifice is a mucosal fold in the left anterior quadrant called the crescent of the cardia. Often there is a similar fold in the right posterior quadrant. Mucosal blood flow is influenced by psychic, thermal, toxic and other causes. Highlights (brightly lighted spots) are spotty and numerous.

Gastric secretion normally is of three types (a) thin crystal clear and heavy, (b) opaque grey white and patchy which does not run between rugae, (c) swallowed mucus in strings with a clear halo. Rugae which are observed after a small amount of air has been introduced are mucosal elevations. They are larger and abundant over the fundus, greater curvature and the posterior wall than over the rest of the area. When more air is introduced, the folds disappear entirely on the lesser curvature and the anterior wall and become smaller elsewhere. Normal stomach does not exhibit any area of stiffness or rigidity, and as air is introduced more and more, rugae flatten out. The rugae on the greater curvature and the fundus however cannot be effaced. Rarely a thick vein or two may be seen near the fundus.

Incisura angularis (angulus) is a prominent landmark from which bearings are taken to different parts of the gastric cavity. It hangs like a curtain, is smooth and round with a few rugae, and has an anterior and a posterior limb. The rugae over this could be effaced by inflation. Below the anterior limb is a recess which is seen only when the stomach is just inflated. Gastric peristalsis usually starts at the angulus and travels towards the pylorus at the rate of three a minute. The pylorus is a rosette like sphincter opening and closing rhythmically, and sometimes regurgitating bile-stained frothy duodenal contents. Often it is difficult to differentiate an area of spasm from the closed pylorus. The former is (a) more static, (b) proximal in position with complicated irregular folding of mucosa, and (c) more independent of the antral peristalsis.

Gastroscopic Appearance in Diseased Stomach

Since the introduction of biopsy and photography in gastroscopy, the position of the gastroscopist has been made a lot more comfortable. Further these procedures help to limit the inexperienced spectators, a very important factor for the ease of everybody. However, the points to be noted are: (a) Nature and changes in the mucosa, gastric secretion, rugal pattern and motility in response to air inflation; (b) Presence and nature of blood vessels; (c) Presence of foreign bodies; (d) Nature of the pylorus; (e) Contractions and margins of the stoma in post-operative stomach; (f) Congenital defects like diverticula; (g) Nature of the tumour and its pedicle; (h) Nature of the ulcer and the surrounding mucosa; (i) Effects of pressure from outside organs. The following are the conditions normally encountered:

Mucosal vascular disease:

This may occur locally confined to the stomach or as a manifestation of systemic diseases. Mucosa shows bright red angular subsurface haemorrhages of various sizes up to 5 mm. They later become darker and smaller. Bleeding erosions may also be present.

Hereditary haemorrhagic telangiectasia:

Gastroscopy in this condition is contraindicated. According to Palmer, scattered flame-shaped petechiae, irregular purpuric haemorrhages, raised circular haemorrhagic spots and spider telangiectases have been noticed.

Gastric diverticula:

With the rigid flexible gastroscope only the orifice of the diverticula could be observed. To explore the interior Benedict's or Herman Taylor's gastroscope should be useful. True diverticula often arise from the posterior wall near the cardia. False and acquired pulsion and traction types are found in any region. The orifice of the diverticulum appears as a circular hole with narrow rugae passing down. There may or may not be surrounding gastritis.

Diaphragmatic hernia:

Only the supradiaphragmatic portion can be studied. Pressure of the diaphragm may produce venous congestion with erosion, bleeding and ulceration. Mucosa appears oedematous and hyperaemic.

Giant rugae:

In some cases large rugae may be seen to persist after air inflation anywhere in the stomach. They are quite independent of the inflammatory changes. A large ruga may eventrate through the pylorus and cause diagnostic difficulties.

Gastric erosions:

These are seen as small superficial mucosal scratches up to 5 mm. in diameter with a thin hyperaemic irregular margin and with a red or yellow grey base. They disappear as quickly as they appear, and occur in various diseased conditions of the stomach.

GASTRITIS :

Acute superficial gastritis—There is generalised hyperaemia with erosions, haemorrhages and oedema. Vitreous tenacious mucous exudate like thick clear jelly with a tinge of haemoglobin may be seen in strings or lumps. It is fairly adherent. Rugal pattern is obliterated by oedema. Highlights are often increased. Due to pyloric oedema, the stomach cavity may appear larger than normal with plenty of secretion. Movements are limited.

Phlegmonous gastritis—In this condition when the patient actually vomits pus, gastroscopy is contraindicated. Two varieties have been described. The localised form produces submucosal absceses and the generalised form produces pangastritis. In both, the submucosa is the seat of the inflammatory process and in both, the gross appearance is a spongy smooth velvety mucosa with sieve-like apertures exuding pus. There may also be necrotic erosions and haemorrhages. Rugal pattern is obliterated. Rarely there may be polypoid masses about 1 cm. in size caused by the protrusion of the oedematous submucosa through the necrotic orifices.

Emphysematous gastritis—This is nearly the same as the phlegmonous variety save that in this, gas forming organisms are present.

Allergic gastritis—Stomach is superior to any other organ in the manifestation of allergic changes. There is marked oedema and translucency of the mucosa associated with pallor in patches. Highlights are increased except where the mucosa is raised into lumps and polypoids. Rugae are thickened, raised and compressed with scattered erosions. Secretion is increased and grey in colour. There is a distinct absence of inflammatory or infectious features thus indicating a transient phenomenon. Motility is increased. In some cases, erosions and ecchymoses have been noticed without oedema.

Chronic superficial gastritis—This condition is common and generally precedes chronic atrophic gastritis. Most noteworthy features about this condition are patchy hyperaemia and purulent exudate. The patchy areas are of varying size with faint borders and are usually parallel to the rugae. The purulent exudate is thin, opaque and grey without stickiness. It spreads superficially filling the folds between the rugae and flows rapidly to join the mucus lake. Sometimes the exudate instead of being purulent may be mucopurulent and sticky, forming strings. Erosions, oedema and haemorrhages are also present.

Chronic atrophic gastritis—This follows chronic superficial gastritis. Various stages of this condition will be seen in such deficiency diseases as pernicious anaemia, avitaminosis, hypothyroidism, sprue, pellagra and scurvy. The mucosa is slate-red and thin and due to loss of its chief cells, it becomes translucent. Therefore, the sumucosal blue veins and long narrow bright-pink arteries are clearly visible. Gastric secretion is diminished. Highlights are increased and diffuse. Rugal pattern is usually unaltered. The one significant feature is that rugae efface more rapidly than usual and they are slow to reform. The distribution is in patches with indiscrete borders. Gastric motility is unaltered. Erosions and haemorrhages are frequently seen. The atrophic mucosa being loosely attached is prone to true and pseudopolyp formations which are generally accepted as precancerous conditions. In a large proportion of cases achlorhydria is present.

Chronic hypertrophic gastritis—This is a very common condition. Angulus and its limbs are more often involved. Mucosa is cloudy, grey and lifeless. The normal translucency and the highlights are absent. Rugae are not enlarged nor fixed and could be effaced by air inflation. But they are warty or granular and therefore appear segmented. Various sizes of flat topped pebbles may be seen either in patches or distributed diffusely more between the rugae than over them. Large pebbles may take the shape of nodules or pseudopolyp. Erosions and excessive secretion are also present. There is a sense of rigidity of the affected area.

Giant hypertrophic gastritis—This occurs rarely as an advanced stage of chronic hypertrophic gastritis. Here the rugae are very much enlarged with gross changes in the mucosa, submucosa and muscularis propria. There may then be redundancy, cystic inclusions, erosions, oedema, hyperaemia, metaplasia, duct hyperplasia and benign papilloma formations. Rugae then are not effaced by air inflation, and rigidity is marked. Submucosal veins are sometimes seen due to atrophy of the mucosa in certain areas.

Post-irradiation gastritis—It is one variety of chronic hypertrophic gastritis. This is produced by high voltage radiation therapy exceeding the normal tolerance threshold. It may even take the form of a peculiar oedematous pangastritis limited sharply to that area of the stomach included in the radiation portal. Gastroscopically there is generalised hyperaemia and oedema with a thick clear mucous exudate. Rugae are obliterated by the thickened mucosa. Tubular deformity and stiffening of the antrum are also observed. Many petechiae, haemorrhages and clean deep chronic ulcers are also seen. Pylorus remains fixed and patulous with reflux of bile. Perforations and

fistula formations have been reported but malignancy is unknown.

Chronic postoperative gastritis—This is another form of chronic hypertrophic gastritis and may present itself in many varieties. The mucosa is affected in patches and pebbling may be marked. According to Palmer, there is a combination of chronic hypertrophic and chronic atrophic varieties of gastritis in this condition. The stoma may or may not be acting rhythmically with or without reflux of bile. The inflated air escapes out of the stomach rapidly. Rarely the stoma is irregular with one or more hemispherical masses, and may be mistaken for tumour formations. These may actually be the result of invaginations during anastomosis. That famous gastroscopist, Schindler, stated that these masses remain unaltered through the life time of the patient. He also pointed out that when stomal and pyloric contractions are seen in the same stomach the former is more active. Anastomotic ulcers like chronic gastric ulcers but smaller in size, are also seen in some cases. Free suture oftentimes remaining free for several years may cause gastritis and chronic ulcers due to contact irritation. In some very chronic cases torsion of the organ may also be evident.

GASTRIC ULCERS :

Active acute ulcer—They are usually small, about a centimetre in diameter, with peripheral oedema and a band of hyperaemia. The edges are sharp, clean and regular. Because of the marginal swelling, their depth and width may appear the same. When they are multiple, they tend to be in groups. The base is smeared with blood. These ulcers may coexist with achlorhydria. Like erosions, these disappear as rapidly as they appear and usually do not form scars.

Active chronic ulcer—These occur on the lesser curvature near about the angulus. They are circular with regular and sharp edges. The floor is grey yellow and covered with debris or blood. The surrounding mucosa is normal without hyperaemia. According to Schindler, chronic ulcers bleed from the centre and malignant ulcers bleed from the edges. The ulcer bearing stomach exhibits (a) rapidly secreting mucosa, and (b) gastric irritability as shown by local and general spasms. Recently healed ulcers leave behind for some time a smooth shallow depression with converging rugae. Often there is associated chronic atrophic gastritis either near the ulcer or away from it.

GASTRIC TUBERCULOSIS :

Gastroscopically tubercles are seen which break down to form ulcers and fistulae. Multiple ulcers with serpiginous outline and with dirty grey bases are seen. In some areas cicatricial annular contractions are present. All varieties of gastritis have been noticed, but the most common is the atrophic type.

GASTRIC SYPHILIS :

Gastric syphilis—In some of the late cases, antral infiltration with rigidity and chronic hypertrophic gastritis of the body of the stomach have been described. Linear erosions and chronic ulcers with smooth yellow bases, sloping edges and serpiginous borders have been noticed from time to time and red nodules and leukoplakia plaques have been seen in the neighbourhood. Hypersecretion is common.

TUMOUR :

Benign gastric tumours—They have been classified under the following heads : (a) Inflammatory pseudopolyps arising from chronic atrophic mucosa , (b) true adenomatous polyps arising from normal or chronic atrophic mucosa ; (c) hyperplastic polyps arising from chronic hypertrophic mucosa. All these may be pedunculated or sessile. The degree of pedunculation is no indication of benignancy. These are all potentially malignant.

Carcinoma—Borrmann's classification holds good even after the introduction of the operating gastroscope, for the lesion may histologically appear benign at several sites and yet may be malignant at a different site. It is said that gastric carcinoma is rare amongst clergymen. Carcinoma may arise from the surface epithelium or from the deeper glandular epithelium. These latter grow beneath the surface as intramural tumours. All varieties of gastric abnormalities are noticed. The two precancerous gastric lesions are : (a) Chronic atrophic gastritis, and (b) Gastric adenomas. In the presence of these lesions gastroscopic surveillance is important. It is difficult with the naked eye to differentiate between chronic hypertrophic gastritis and malignant infiltration. Effaceability of the rugae upon inflation usually denotes benignancy. Stocker's signs which are in favour of infiltration are : (a) Resistance to inflation ; (b) Displacement and not indentation of the posterior wall to transmitted aortic pulsation ; (c) Rigidity of the area during respiratory excursions ; (d) Intolerance of the gastric wall to inflated air and failure to collapse after deflation ; (e) Decreased mobility of the gastroscopic field ; (f) Decrease in the size of the gastric lumen. The main differentiating points between malignant gastric ulcer and benign ulcer

are the overhanging edges, surrounding mucosal changes and the rigidity present in the former.

Benign connective tissue tumours of the stomach—These are difficult to distinguish gastroscopically. Stretching of the mucosa over the tumour may produce bleeding, erosion and ulceration. Leiomyoma is the commonest. Sarcoma is also difficult to diagnose and type by naked eye characters.

Infiltration of the stomach by extrinsic tumour—Carcinoma of the pancreas, retroperitoneal sarcoma, para-aortic node, renal tumour, adrenal tumour and colon tumour may all invade the stomach. Gastroscopic differentiation of these is difficult.

CASE NOTES

CRUVEILHIER-BAUMGARTEN SYNDROME

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In 1835 Cruveilhier described a case who had dilated veins in the abdominal wall and a caput medusae with a loud venous murmur. The condition was thought to be due to congenital failure of obliteration of the foetal umbilical vein, leading to secondary hepatic atrophy. In 1891 Baumgarten reported a similar case and this accounts for the present use of the term 'Cruveilhier-Baumgarten syndrome': Baumgarten's patient was a sixteen year old boy who died following a gastric haemorrhage and autopsy revealed widely patent umbilical vein and hepatic atrophy. Baumgarten attributed the condition to primary congenital hypoplasia of the liver in addition to the failure of obliteration of the umbilical vein.

The concept of this syndrome as postulated by Cruveilhier and Baumgarten is, however, no longer tenable and it has been conclusively accepted that hepatic cirrhosis is the primary event and the umbilical vein becomes dilated due to portal hypertension produced by hepatic fibrosis (Sherlock, 1955).

In a foetus the oxygenated blood enters the body through the umbilical vein which runs upwards from the umbilicus to terminate in the left division of the portal vein inside the liver from where the blood is carried chiefly by the ductus venosum to the inferior vena cava *via* the left hepatic vein. After birth, the umbilical vein becomes atrophic and gradually gets obliterated. However, as reported by Segall (1923) the umbilical vein remains partly patent in a significant percentage of normal subjects and its lumen communicates with the left division of the portal vein in some of these cases. If such a subject develops portal hypertension due to intrahepatic cause (e.g., hepatic cirrhosis) the portal blood enters the patent umbilical vein *via* the left division of the portal vein and distends it with the production of a loud continuous venous bruit over the anterior abdominal wall below the xiphisternum. If the whole of the umbilical vein is patent, caput medusae develops at the umbilicus because the portal blood travels upto umbilicus *via* the umbilical vein and thence radially in all the four directions as that is the normal venous drainage from the umbilicus. However, it is very uncommon for the umbilical vein to be patent throughout its entire course and, therefore, caput medusae formation is very rare. Collateral channels develop between the distended umbilical vein and the branches of the internal mammary vein through which the portal blood travels upwards to superior vena cava. That these distended abdominal veins carry portal blood can be demonstrated by simultaneously estimating the blood glucose levels from one of these veins and from the anticubital vein. The portal blood glucose would naturally be significantly higher than the systemic venous blood glucose.

The venous bruit is produced in the collateral veins in the abdominal wall by the rapid passage of blood through a relatively constricted vessel into a dilated one (Thayer, 1911). It may also be produced at the points of constriction in the course of a dilated tortuous vein and by the eddying of currents in a blind dilated venous sac or pouch. Detection of venous distension at the subxiphisternal or periumbilical region with a venous bruit over them is indicative of portal hypertension of intrahepatic causation (lesion distal to the communication of the umbilical vein and the left division of the portal vein). These signs cannot occur in cases of portal hypertension of extra-hepatic causation as the site of lesion in these cases is proximal to the opening of umbilical vein into the portal circulation and, therefore, the umbilical vein should not be distended.

Case Report

G., aged 20 years, was admitted into the Balrampur Hospital, Lucknow, on 14-4-1958. His presenting symptoms were general weakness, malaise and presence of an abdominal lump of several years' duration which had become painful and tender recently. In addition, he had pyrexia, cough and chest pain of five days' duration. He gave a history of jaundice lasting three months about eight years ago after which he is said to have recovered fairly well. He denied having had any haematemesis but had had occasional epistaxis recently.

On examination the patient had moderate anaemia with malnutrition and poor development of secondary sex characters. There were prominent engorged veins along the lower half of the right parasternal line and below the xiphisternum and a loud continuous bruit over them was audible. It tended to disappear on holding the breath at full expiration and became louder during inspiration.

The direction of the flow of blood was from below upwards. No spider naevi, palmar erythema, gynaecomastia or pitting oedema were noticeable. No obvious neurological symptoms were present. The lower lobe of the left lung showed pneumonic consolidation. A haemic murmur best audible in the pulmonary area was present.

The liver was just palpable below the right costal margin. It was firm and not tender. No ascites was detected. The spleen was enormously enlarged, extending upto two inches below the umbilicus and was tender.

Laboratory investigations—Urine and stools showed no abnormality.

Blood: Haemoglobin—8·5 g. per cent; W.B.C. —2800 c.mm.; R.B.C. 3·05 million/c.mm.; colour index 0·95; P.C.V. 29 $c\mu\mu$; thrombocytes 56,000/c.mm., serum albumin 2·5 g. per cent., serum globulin 3·8 g. per cent.

Liver function tests: Cephalin-cholesterol flocculation test—three plus; thymol turbidity test—three plus; van den Bergh's test—negative; blood glucose from superficial abdominal vein 125 mg. per cent and from antecubital vein 86·6 mg. per cent.

Sternal marrow smear—General hyperplastic reaction but scanty megakaryocytes (suggestive of hypersplenism taken in conjunction with the peripheral blood picture).

Skiagram of the chest showed left lower pneumonia. Barium swallow revealed oesophageal varices.

The pneumonia cleared satisfactorily on treatment with penicillin but the pancytopenia showed no significant improvement on treatment with various haematinics.

Discussion

This case is a typical example of portal cirrhosis with portal hypertension, Cruveilhier Baumgarten syndrome and secondary hypersplenism. Hypersplenism has been postulated to account for the pancytopenia because there is no other obvious cause for it, it failed to show any significant improvement on treatment with various haematinics and the bone-marrow smear was indicative of active hyperplasia and inhibition of the release of the blood corpuscles. The sequence of events in this case may be summarised as follows:

Infective hepatitis and malnutrition led to the development of portal cirrhosis and portal hypertension which in its turn caused congestive splenomegaly (with later development of perisplenitis) and Cruveilhier-Baumgarten syndrome in the presence of congenitally patent umbilical vein. The congestive splenomegaly caused secondary hypersplenism with peripheral pancytopenia which lowered the general resistance of the body with the development of lobar pneumonia.

Cruveilhier-Baumgarten syndrome is a rare condition although portal cirrhosis and the attendant portal hypertension are quite frequent—the reason being that not many cases of portal cirrhosis have congenitally patent umbilical vein. Presence of this syndrome is in a way advantageous to the patient because it provides a reliable byway for the transport of portal blood to the heart and the risk of fatal haemorrhage from the oesophageal varices diminishes considerably. Therefore, portacaval shunt operation is seldom indicated in these cases. However, there is an added risk of portal systemic encephalopathy as encountered in cases with portacaval shunts. The reason is that nitrogenous substances absorbed from the gut into the portal blood get the chance of freely entering the systemic blood circulation directly without having to go through the detoxication processes in the liver and can thus exert their toxic effects on the brain to cause hepatic encephalopathy.

Summary

Clinicopathological importance of Cruveilhier-Baumgarten syndrome is discussed and a case reported.

Acknowledgments

Our thanks are due to the Pathologists, Dr. C. M. Tewari and Dr. A. N. Gulati for kindly carrying out the laboratory investigations and specially for interpreting the bone-marrow smear.

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CERVICAL ARACHNOIDITIS

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Arachnoiditis was recognised as a disease entity as far back as 1927. It is considered as a low grade inflammation in an avascular membrane, occurring in association with numerous types of inflammatory disorders of the more vascular structures (pia- and/or dura-mater), leading by a variety of mechanical means to secondary changes in the neural structures it envelops. The name itself is a misnomer since the arachnoid is an avascular membrane and as such cannot undergo inflammatory changes. Associated inflammation of either the pia- or dura-mater or both, is invariably present. Following is a case report of a male with cervical arachnoiditis with remarkable recovery after treatment.

Case Report

Mr. K., aged 28 years, typist by profession, reported to the Government General Hospital, Madras, on 24-8-54 with complaints of inability to walk for 10 days and pain in the region of the neck, right shoulder, and right arm for 6 weeks.

The onset was slow and progressive. The pain started in the right arm and neck in June 1954. The pain was dull, constant, not radiating down the arm, worse when the arm was pulled (while carrying heavy articles) and on coughing. Soon after he developed fever. An x-ray of the cervical spine taken elsewhere failed to reveal any caries of the spine. Yet he was given a P.O.P. collar and some parenteral injections. He was relieved of fever but pain in the right arm persisted. He soon noticed weakness of both legs which progressively increased and for the last 10 days he was unable to walk at all. He also complained of diminished sensation below the nipples, and some weakness of the left upper limb. There was slight hesitancy of micturition.

There was no history of injury to the spine, spinal anaesthesia, heavy manual labour, venereal disease or arthritis.

On examination, he was a well nourished young man in good general health. Examination of the nervous system showed evidence of (a) bilateral pyramidal lesion below first dorsal level as evidenced by loss of abdominals and cremasterics, exaggerated knee and ankle jerks with clonus and plantars extensor ; (b) loss of pain, touch and temperature and vibration sense symmetrically below the 3rd ribs. There was no evidence of vertebral disease. Movements of the neck were full, free and did not produce any shooting pain. Other systems were normal. He was apyrexial.

LABORATORY INVESTIGATIONS :

E.S.R.—49 mm. per hour.

Skiagrams of cervical and upper dorsal spine showed no evidence of bony disease. Skiagram of chest was normal. Myelogram showed a hold up of lipiodol at the cervical region as droplets.

Lumbar puncture—C.S.F. was clear, colourless and under low tension. No evidence of thecal block. Lymphocyte—8 c.mm., proteins—200 mg. per cent, globulin—present, chlorides—550 mg. per cent and sugar—10 mg. per cent.

Cultures (including those for tubercle bacilli) were negative. Blood and C.S.F. for V.D.R.L. were negative.

Mantoux (5 T.U) was negative.

A provisional diagnosis of nontuberculous, chronic, localised, cervical meningitis was made.

Operation—An exploration of the lower cervical cord region was made. The meningeal covering was found to be thickened and opaque and cord pulsations were absent. As soon as meningeal covering was divided a little C.S.F. escaped and the cord could be seen. Pulsations became marked. There was no macroscopic evidence of damage to the cord or any vertebral disease. The cut edges of the meninges were thick and fused. The adhesions were released above and below and the wound closed. The patient made an uneventful recovery. Within 6 days he noticed reduction of pain in the right arm and shoulder though the pain in the neck persisted. In 2 weeks the tone in lower limbs had decreased and power improved. Four weeks later plantars were flexor on both sides ; jerks in the lower limbs were normal and the patient could walk about. All sensations below the nipple returned and at the time of reporting he has no abnormal signs except the operation scar. He is leading a full, useful life.

Comments

The case showed definite evidence of cervical cord and root compression and since there was no radiological evidence of vertebral disease (though disease had gone on for about 6 weeks) a clinical diagnosis of extramedullary cervical cord compression seemed to explain the clinical picture. Myelogram favoured a diagnosis of arachnoiditis, subsequently proved on the operation table. It is usually met with in the middle age period, more in the males. It is rare before the age of 20. Pathogenesis of such chronic inflammation is not very clear.

Stookey (1927) lays great stress on the physiological movements of the cord during respiration. Sometimes slender bands are found attaching the dura and archnoid to the cord. These slender bands, though in themselves innocuous, by virtue of anchoring the mobile cord to the relatively immobile dura exert a constant traction on it during respiration. Such a persistent traction, made worse by coughing, sneezing or straining, may in due course of time cause changes to develop in the neural tissue. Since maximum movement of the cord occurs in the cervical region, this is the commonest site of incidence.

Summary

A case report of a young adult with root irritation in the neck and paraplegia is presented.

Investigations suggested and surgery proved the cause to be meningitic adhesions in the region of cervical cord.

Complete recovery occurred after release of adhesions.

Acknowledgments

I am thankful to the Dean, Government General Hospital, and Professor K. S. Sanjivi, Physician, for permission to report this case and to Dr. B. Ramamurthy, Neurosurgeon, for the surgical aspect.

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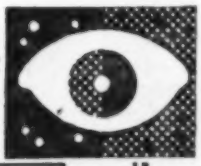

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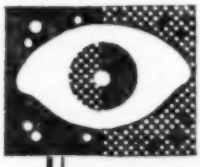

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MENTAL HYGIENE THROUGH THE SEVEN AGES OF MAN

This year the World Health Day was observed on the 7th of April and attention was focussed on mental health and illness because of the considerable increase in the incidence of mental illness of late throughout the world. What ways and means are to be adopted to put a check on mental maladjustment and emotional unbalance? It can be said with certainty that the cause is rooted in most cases in the early childhood incidents of most of the patients. Hence in preventive psychiatry so much stress is laid on the ways of bringing up of children in the first years of life. Bereft of love and sympathetic understanding children cannot grow up in a healthy fashion. Instruction on discipline must be based on understanding, reason and consistency.

In infancy and early childhood feeding, wearing and toilet-training all require careful handling as these acts are emotionally tinged. The child must be respected as a person and he must be allowed to develop according to his own pattern rather than being moulded on a set model. Mistakes must be corrected without hurting the feelings. Invidious comparison, favouritism, ridicule, sarcastic remarks and criticism are definitely harmful. Now-a-days sometimes both the parents go to work to improve the financial position of the home, leaving the children to their own fate or under the care of some indifferent person. In such cases and even when the young child is kept in an institution hygienically excellent, he is emotionally starved because of the lack of parental affection and care and he turns out to be an unsatisfactory adult later on. It is a sound practice on the part of the parents to listen to what the children want to say ; in this way repression could be avoided to a great extent.

In later childhood, group activities and social life ought to be encouraged and the child must be allowed to participate in play and extracurricular activities which prove his worth. This is how the sense of inferiority could be overcome. If these principles are not taken into consideration, difficulties in the form of stammering, reading retardation, timidity, anxiety and aggressive tendencies are likely to appear.

In the adolescent period three special problems come to the fore. These are the adolescent's need for gaining adult social status, proper orientation to the aroused sex impulses and the right selection of a vocation, i.e., occupational adjustment enabling one to lead an independent and responsible life. Defective guidance in these fields results either in the outbreak of such antisocial behaviour as stealing and rebellion or in the development of psychological disturbances in the form of hysteria, obsession-compulsion and schizoid tendencies.

The adult person during the third and fourth decades of life has to make the primary adjustment to work which gives him stability and the sense of achievement. The ideal thing of course, is the selection of job according to one's interest, intelligence and aptitude. However, in India the situation falls far short of the ideal where we find more often attempts at fitting square pegs into round holes resulting in frustrations and disappointments as their aftermath. The adult would find much satisfaction and relief if he cultivates some hobbies and develops some interests to fill in the leisure time. Marital adjustment is another sore point which can be dealt with successfully by mutual understanding, giving up selfishness and fostering the spirit of tolerance if immediate satisfaction is not forthcoming.

In the middle age the pressure of work and responsibilities increase by leaps and bounds and the burden may become too heavy to bear. Enforced rest is indicated in such cases to prevent development of mental disturbances.

In old age there are difficulties all around. With the impairment of the functions of sense organs such as seeing and hearing, there is a slowing down of muscular functions together with incoordination. Psychological disturbances in the form of memory loss, diminished power of attention, concentration and thinking make serious type of work impossible. Even when things look so gloomy, matters can certainly be improved by doing some work according to one's capacity and by indulging in some hobbies such as gardening, reading, writing and joining religious discussions, etc.

Thus in all ages the three fundamental principles of mental hygiene consist in sustenance of mental health by adequate satisfaction of emotional needs, prevention of the onset of mental disorders and treatment of mental illness in its early stages by appropriate therapeutic measures before the disorder becomes chronic and firmly established. Social adaptability is the essential criterion of healthy mental life.

CURRENT MEDICAL LITERATURE

I. V. Diphtheria Antiserum

TASMAN, A., MINKENHOF, J. E., VINK, H. H., BRANDWIJK, A. C. AND SMITH, L. (*Lancet*, **1**: 1299, 1958) from the National Institute of Public Health, Utrecht and the Infectious Diseases Department of the Wilhelmina Hospital, Amsterdam, from an investigation which clearly brought out the advantages of the intravenous injection of antitoxic serum in patients suspected of diphtheria, compared with the commonly used intramuscular injection made the following observations:

The intravenously injected antitoxin immediately brings the patient's serum "up to titre", whereas absorption of the intramuscularly injected antitoxin is slow, usually not being complete until after about 4 days, and sometimes 6 days.

Intravenously injected antitoxin is not excreted more rapidly than intramuscularly injected antitoxin.

Very shortly after the intravenous injection of antitoxin a small portion of it is excreted through the salivary glands into the saliva, which it renders atoxic. Consequently from this moment no more toxin will be absorbed from the saliva through the inflamed and damaged tonsils and wall of the pharynx.

The results of experiments on guineapigs indicate that patients intravenously injected with antidiphtheritic serum may be expected to show fewer lesions of the heart (myocarditis and fatty degeneration), fewer post-diphtheritic paralyses, and a lower mortality than patients intramuscularly injected with antiserum.

With due observance of the necessary precautions—e.g., a skin test for hypersensitivity (which must be negative)—diphtheria antitoxin should be injected not intramuscularly but intravenously whenever such an injection is required, even in mild cases of diphtheria.

Acute Pancreatitis Complicating Pregnancy

WOLTER, D. F. AND DE ALVOREZ, R. R. (*Am. J. Obst. & Gynec.*, **75**: 1270, 1958) from the Department of Obstetrics and Gynecology, University of Washington School of Medicine and from King County Hospital, Washington, observe:

Acute pancreatitis occurs in all trimesters of pregnancy and should be suspected in all cases of vomiting of pregnancy.

The diagnosis of acute pancreatitis should be considered during pregnancy in the presence of acute abdominal pain, protracted vomiting, circulatory collapse, and electrolyte imbalances.

The diagnosis is confirmed by the laboratory finding of elevated serum amylase (levels above 200 Somogyi units) and elevated urinary diastase.

Serum calcium is of immediate importance in management and prognosis.

Treatment is of the acute pancreatitis, rather than of the pregnancy, and is medical: (a) Nothing per os until the acute phase has subsided; (b) continuous gastric suction by nasal tube; (c) vagus nerve depressant; (d) support of circulatory collapse with whole blood; (e) sedation; (f) careful maintenance of fluid and electrolyte balance; (g) calcium as indicated for depressed calcium levels; (h) surgical intervention for drainage of pancreatic cysts or pseudocysts; (i) protein replacement for large urinary losses of nitrogen.

No causative relationship between pregnancy and pancreatitis has been demonstrated.

The mortality rate should not exceed that of pancreatitis not associated with pregnancy.

When pancreatitis complicates pregnancy, the obstetrician is charged with its early diagnosis and specific treatment.

Cytology vs. Colposcopy in Diagnosis

LAMFURG, H. (*Am. J. Obst. & Gynec.*, **75**: 1298, 1958) from the Universitats-Frauenklinik, Hamburg from the comparative evaluation of cytology and colposcopy in the diagnosis of early cervical carcinoma observes that these methods complement each other in ideal fashion in diagnosing early stages of carcinoma of the cervix uteri. With the smear method in carcinoma *in situ* cases there was an error of 11·1 per cent (out of 313 cases). This may be due to the very small extent of the lesion. Colposcopy had a 3 per cent error (out of 336 cases of carcinoma *in situ*). By the combination of the two methods the incidence of carcinoma *in situ* was increased to 27·7 per cent, the Group I carcinoma to 36 to 40 per cent of all cervical carcinomas. To the author's knowledge, up to the present time, these figures have not been achieved by any worker with the smear method alone.

Megaloblastic Anaemia of Pregnancy and Puerperium

GILES, C. AND SHUTTLEWORTH, E. M. (*Lancet*, **2**: 1341, 1958) from City General Hospital, Stoke-on-Trent, give in the following lines the summary of their observations on 474 cases of anaemia in late pregnancy and puerperium during a period of 15 months (investigated by sternal puncture, blood-counts and serum-iron estimations):

In 90 cases a megaloblastic marrow was found, 28 of them in the puerperium.

All cases were treated with folic acid. The reticulocyte peak and the drop in the serum-iron level reflected the response to treatment in a majority of patients.

Anaemias with haemoglobin of less than 45 per cent were more often megaloblastic than normoblastic. Achlorhydria occurred in 37 per cent of cases, and fat absorption was impaired in 4 instances. No special seasonal incidence was noted. The mean age was 28·9 years, and 80 per cent of patients were multiparae.

Gastrointestinal symptoms were uncommon, and the incidence of complications was not substantially higher than in the normoblastic anaemias. In 42 per cent of women the diet was poor, compared with 12 per cent of cases of normoblastic anaemia and 4 per cent of

healthy controls. The difference was even greater in a comparison of meat intake.

No local factors could be discovered to account for the high incidence in this series.

Surgical Ascariasis in Children

FERANDO, N. (*J. Trop. Pediat.*, **4**: 61, 1958, Ref. *J.A.M.A.*, **168**: 1407, 1958) writes that obstruction has been the commonest surgical complication of ascariasis, the condition usually commencing with vomiting, often after the administration of a vermifuge. In the 50 cases reviewed, 28 of the children had been given a vermifuge a few days prior to admission. Associated with the vomiting was colicky abdominal pain, mild at the onset but gradually increasing in severity and localised to the umbilicus. The child often vomited roundworms, and had constipation, and in the more advanced cases there was abdominal distention with visible peristalsis. An ill-defined sausageshaped mass lying transversely across the lower abdomen, more often to the right, was found. In the majority of these malnourished children the worms could be palpated through the abdominal wall, and the lump of worms was often disclosed at rectal examination.

That obstruction is at least partly mechanical is shown by the longitudinal disposition of the worms along the length of the intestine, twisted very much in the fashion of ropes. The worms, whose natural habitat is the upper part of the small intestine, may partially or completely obstruct the lumen of the intestine, may vary from a few to several hundreds in number, are often twisted tightly upon themselves, and may thus be propelled onwards along the intestine like a sausage or foreign body. The obstruction may be partly due to spasm of the intestinal muscles, caused by the irritation and reaction of the chitin from the outer covering of the worm's body on the intestinal mucosa of the host, or the introduction of a purgative or vermifuge may cause the worms to secrete a toxic fluid which will initiate the spasm. Although rare, intussusception can be caused by the roundworm, and 4 such examples were encountered in the present series. Volvulus caused by the ascaris parasites is rare and often fatal, 3 such cases being described in this series. In acute obstruction with peritonitis at operation, a perforation with ascarides in the peritoneal cavity is frequently found. However, no perforations were found associated with obstruction in this series, although a search was made in 4 cases. In the remaining 24 cases a perforation was found in either the appendix, the jejunum, or the ileum. It is of note that many examples have been reported where no perforations were detected, although live roundworms were found in the peritoneal cavity.

The presence of Ascaris infection in the various organs produces no pathognomonic pattern. Since the small intestine is the habitat of ascarides, the commonest symptoms are referable to this viscus and vary from vague epigastric distress, nausea, or vomiting to the severest excruciating abdominal pain of perforation or obstruction. There may be associated systemic manifestations, such as anaemia, fever, malnutrition, anorexia, lassitude, insomnia, urticaria, headache, and, rarely, convulsions. The diagnosis depends on the identification of the ova or the worms in the faeces. Two methods are commonly employed in the treatment of obstructions: (1) manual disengagement of the ascaris bolus without enterotomy, and milking the worms into the caecum by gentle manipulation; and (2) enterotomy with evacuation.

Muscle Weakness in Infants and Small Children

JOHNSON, R. W. (*J.A.M.A.*, **168**: 1306, 1958) from the Division of Physical Medicine & Rehabilitation, Department of Medicine, Ohio State University and the Regional Respirator Centre, Children's Hospital, writes that the diagnosis of suspected muscle weakness in infants up to the age of five years is difficult unless one uses a systematic approach. The steps in the examination are (1) palpation of the muscles, (2) examination for muscle tightness, and (3) demonstration of muscle function. Palpation not only reveals tenderness but also distinguishes among conditions that affect the consistency of the muscle mass. Tightness may be seen in either the affected muscle or their antagonists during passive movements. To observe the function of individual muscles calls for much special manoeuvering and close observation. Even after the child supposes the examination to be over, the movements of its arms during the act of dressing afford indications as to the status of the deltoid and other muscles of the upper extremity. Electrodiagnostic methods can prove helpful. These methods of differential diagnosis are essential to proper treatment, since they may decide, as in the case history here cited, between such conditions as poliomyelitis and polymyositis.

Massive Corticosteroid Therapy in Resistant Thrombocytopenic Purpura

WEISBERGER, A. V. AND SUTHERLAND, L. G. (*Am. J. M. Sc.*, **236**: 425, 1958) from the Department of Medicine, University Hospitals and Western Reserve University School of Medicine, Cleveland, Ohio, write:

In certain patients with resistant thrombocytopenic purpura large doses of prednisolone can produce a rise of platelet count and a cessation of bleeding phenomena when ordinary therapeutic doses of corticosteroids are ineffective.

The presence of adequate numbers of megakaryocytes in the bone marrow is essential for this effect in most instances.

The platelet count usually returns to thrombocytopenic levels when the dosage of corticosteroids is reduced to ordinary therapeutic levels.

Complications attributable to the large doses of prednisolone used in these studies were uncommon. However, therapy with massive doses of corticosteroids should be reserved for acute emergencies rather than for maintenance therapy.

CURRENT TOPIC

MALARIA ERADICATION*

The Problem

For centuries malaria has taken a heavy toll in human lives and economic loss; wherever it exists human progress has retarded. Man's struggle against this disease has been unremitting and age-long; yet as recently as 1955 it was striking each year 200 million people and causing two million deaths. Today more than 1100 million people are exposed to malaria. With the growth of international traffic the danger of accidental reintroduction of malaria into countries from which it has been eradicated is ever present.

The consequences of malaria cannot be reckoned only in terms of the human deaths and suffering that lie behind these figures. The importance of the disease from an economic and social point of view derives from its many insidious effects. Malaria is the world's greatest single cause of disablement; it stunts physical and mental development; it hampers the exploitation of natural resources, reduces agricultural production, and impairs industry and commerce.

In at least 120 countries and territories of the world, out of a total of some 200, malaria acts as a drag on economic development, although it is not yet possible to assess statistically the full economic effects in all the areas where the disease is rife. The relationship between health and economic development has long been recognised, but computation of health factors in economic terms is a relatively new technique. An added difficulty is the lack of reliable data in many areas. Estimates have however been made in some instances, and although partial and incomplete, they do show for the areas concerned serious losses in human capital, in man-hours and in agricultural and industrial output.

The effect of malaria on the economy is usually measured quantitatively under the following heads:

1. Expenditure on medical care versus cost of malaria eradication—Expenditure on medical care, drugs and the hospitalisation of malaria cases varies considerably from country to country, according to the availability of local medical services and their degree of development. One feature is however common to such expenditure in all affected countries: it is recurrent and thus a continual drain on the national economy. Indeed, the total amount of this expenditure over a five-year period may be as much as the estimated cost of malaria eradication, for which the capital outlay is limited to a period of about five years.

Recent annual average costs of malaria control by residual spraying, per person protected, have been estimated and shown in Table 1.

2. Losses in manpower—Premature death caused by malaria occupies the first place under this head. In terms of economics, deaths occurring at age 15 or under may be considered on an average to represent a net loss to society; where death does not occur before age 40, there is a net economic gain and where death does not occur until age 65 the net gain is more than twice as great. In many parts of the world mortality in infants and children, caused directly or indirectly by malaria, is appalling. In Africa, for example, it is estimated that from 10 to 15 per cent. of children below the age of three or four years die of the direct effects of the disease. The indirect effects when malaria increases the mortality from other diseases cannot be easily assessed, but are certainly very high.

Table 1

Region	Per capita cost US $
Africa	0·41
The Americas	0·455
South-East Asia	0·11
Europe	0·20
Eastern Mediterranean	0·20
Western Pacific	0·175

The cost of eradication would be 10 per cent higher.

The loss of working time is one of the economic effects of the disease that can be assessed with a fair degree of accuracy. It has been shown that each infected adult suffers from at least one recurrence of malaria annually which incapacitates him for six days. Computation of the total number of malaria cases and the percentage of the economically active population shows that in 1955 the annual loss of working time due to the average six-day attack was some 130 million man-days in India, 4 million in Mexico and from 9 to 9·5 million in Thailand.

In addition to causing the loss of life-capital through premature death and the loss of working time through the annual six-day attack, malaria decreases working capacity throughout the year. To compute the money value of the losses caused by the decrease in production it would be necessary to determine the exact extent of disablement; this requires further study. In India, however, the annual loss on this account has been estimated at $450 million, on the assumption that the decrease of working capacity amounts to 25 per cent.

3. Effect of malaria on land utilisation and industrial development—In the densely populated monsoon areas of Asia, in Central America and equatorial Africa, great tracts of fertile land lie uncultivated or abandoned because of malaria—and the situation thus created is aggravated by the growth of population and the increased pressure on land. Since the introduction of malaria control measures during the last decade, large areas of unused, rich agricultural land have been brought under cultivation in Ceylon, India, Java, Mexico and elsewhere, thus changing the previous conception of a static "population maximum" in such areas.

* Issued by the World Health Organisation, Palais des Nations, Geneva, 1958.

The adverse effect of malaria on engineering projects and industrial development generally is widely recognised: the delays in the building of the Panama Canal, the Alexandra Docks at Bombay, and the Bengal-Nagpur railway, are examples commonly cited. Less dramatic but more insidious is the effect of malaria as a constant factor adding to costs of manufacture and of mining in tropical and sub-tropical areas. Since malaria is mainly a rural disease, quantitative figures of its repercussions on industry are very rudimentary. However, with the accelerated pace of industrialisation in the economically less-developed countries, the effects of malaria on industrial development and production are becoming more important.

These are obviously not the only fields in which the effect of malaria is calculable in economic terms. The techniques designed to express the effects of the disease in economic terms can and will be improved. Furthermore such figures, to be fully significant, must be examined within the social and economic context to which they relate.

Social and other repercussions, the apathy and lethargy resulting sometimes in general social stagnation, cannot be expressed in monetary terms. Programmes for social improvement set great store by village development, but if the villager is periodically on his back with chills and fever and has chronic anaemia, such schemes have little prospect of success. Similarly, emphasis on agricultural improvement—better seeds and farming methods— is of little purpose if the peasant, because of malaria, can hardly drag himself into the fields at planting time; for him the learning of new methods is only an added burden. Again, to the child with malaria improved schooling can bring little benefit.

The social and economic repercussions of malaria make it the world's most expensive disease.

Eradication

The events leading to malaria eradication make up a chain of happenings over a period of 350 years. First came the discovery in the seventeenth century of the extraordinary febrifugal properties of cinchona bark, which had been used by the Indians of Peru a long time before. The last century marked definite progress in malariology. In 1810 quinine, an extract of this bark, was discovered; it was to remain the remedy par excellence until superseded by modern antimalarial drugs. Then the cause of malaria, the single-celled parasite, was discovered, the anopheles mosquito was identified as its carrier, and its manner of transmission was established.

Thenceforward antimalaria measures were concentrated on eliminating the mosquito. Breeding places were attacked so that the larvae could be destroyed before they became winged adults capable of transmitting the disease. Surface water was removed by drainage and chemicals were used to kill developing larvae. Every collection of water was a threat—swamps and marshes, hollow stumps of trees and, during the rainy season, every depression or receptacle that would hold water long enough for mosquito eggs to hatch. These were highly expensive methods, efficient only in countries which could devote considerable funds to malaria control.

New possibilities for combating malaria were opened by the discovery in 1939 that DDT, a chlorinated hydrocarbon product, was a powerful contact insecticide with residual activity. It was for this discovery that Paul Muller was awarded the Nobel Prize. DDT was the first insecticide whose activity was found to persist for months after it had been sprayed on a surface. Other chlorinated hydrocarbon insecticides which have since been developed, notably BHC and dieldrin, have supplemented but not replaced DDT.

After the Second World War DDT became the main instrument in malaria control, and the attack shifted from the larvae to the adult mosquitos. Anopheles mosquitos, after biting, rest on the inside walls of dwellings. They pick up from the sprayed surface a lethal dose of insecticide and die before any malaria parasites which they have sucked with the blood of an infected person can develop and be injected into a healthy one. Thus the cycle of transmission—man-mosquito-man—is broken.

The World Health Organization's original malaria control policy implied the indefinite continuance of spraying campaigns. This meant the maintenance of a complex administrative machinery, the permanent employment of valuable health workers and technicians in malaria control activities, and above all a ceaseless drain on countries' financial resources. A solution which would not entail an indefinitely maintained control was needed.

The malaria parasites usually disappear from the blood of their human hosts after three years. If the break in the cycle can be maintained for three years and no new cases are infected, the transmission cycle will remain permanently broken, even though all mosquitos may not have been killed. This has been proved by experience. In Greece, where a nation-wide spraying campaign had been started in 1946, the spraying had to be discontinued in 1951 in some areas for lack of DDT supplies. Contrary to expectations there was no startling recrudescence of malaria in those areas.

These findings led to the idea of discontinuing spraying once the transmission of the disease had been stopped and to the possibility of eradicating malaria by means of a campaign limited in time. After this had been thoroughly studied, the Eighth World Health Assembly, in 1955, set the eradication of malaria as the objective of antimalaria activities. A similar decision as regards the Region of the Americas had been taken by the XIV Pan American Sanitary Conference in October 1954.

A malaria eradication programme is a development of normal malaria control but differs radically from it in a number of ways.

The campaign is divided into four phases. The first, usually completed within a year, is devoted to surveys, the preparation of detailed plans and the recruitment and training of personnel—the field army.

In the second phase, the attack begins. For all its dramatic appeal, this is a hard slogging operation demanding infinite attention to detail, and lasting three to four years. Every habitation is sprayed with insecti-

cide, and the spraying, usually done twice a year, must be efficient and complete.

The aim of the third, or "consolidation" phase, is to eliminate all remaining human reservoirs of infection by case-finding and the use of antimalarial drugs. Malaria eradication is considered to have been successfully achieved when three years of surveillance show no locally contracted new cases.

From this point begins the final phase of the programme—the "maintenance" phase. Maintenance becomes a normal, comparatively inexpensive function of the local health service. As long as malaria exists anywhere in the world, the areas where eradication has been successful must be checked for signs of any recurrence and guarded against the introduction of new human reservoirs of infection.

Nine countries or territories, once highly malarious, have reached the maintenance stage of their programme. Seven others are far advanced in their stage of attack. In forty-five an eradication programme is being implemented. Fourteen are about to plan or start field operations. About sixty countries or territories have yet to take the first steps towards malaria eradication.

The Urgency

The eradication programme is becoming ever more urgent because the mosquito vectors continue to develop resistance to commonly used insecticides in different areas. Nature, with its inherent resistance to any change introduced by man against its order, has struck back. In 1951, the first news that the malaria mosquitos had ceased to die from DDT came from Greece, where an antimalaria campaign had been in full operation. The alarm was immediately given; research and tests were intensified and new teams of experts and observers were sent into the field. Of the sixty species of mosquitos known to be malaria vectors, four have so far developed resistance against insecticides. From intensive research work currently being carried out there are indications that the insecticides now available could become ineffective within five to ten years. This would deprive us of the only practical means of eradicating malaria at present available.

The development of physiological resistance in anopheline vectors is one of the most serious threats to malaria eradication. It is for this reason that eradication has become a race against time.

A first step in a world wide eradication campaign has been taken. In co-operation with national governments and the international agencies concerned, WHO has drawn up a global malaria eradication programme for the period 1958-1962. On its completion, malaria eradication will have reached an advanced stage in many of the stricken areas of the world and some 500 million people, hitherto at risk, may be free from the danger of the disease.

Eradication cannot yet be undertaken in areas where economically feasible procedures for the interruption of transmission have not been developed. This applies to large areas of tropical Africa and New Guinea and to limited areas elsewhere. Here local research must be intensified in order to find an economical solution.

The Needs

During the next five years, an expenditure of approximately $600 million will be required for malaria eradication. The combined expenditure of those countries where eradication can already be undertaken with expectations of success will approximate 55 per cent of the total, or $325-350 million. Thirty-five per cent may be expected over the period from other sources, such as the United States International Co-operation Administration, USA Loan Capital, and the United Nations Children's Fund. The remaining 10 per cent represents the sum which must be obtained through the World Health Organisation. Part of this sum will be provided by WHO through its regular budget and the Expanded Programme of Technical Assistance, but approximately $50 million will have to be raised from voluntary contributions.

Table 2

	1958 US $	1959 US $	1960-62 US $	Total US $
Africa	223,288	308,213	1,582,250	2,203,751
Americas	2,999,706	3,413,842	9,823,491	16,237,039
South-East Asia	2,524,819	1,289,412	9,981,837	13,796,068
Europe	222,497	286,970	452,009	961,476
Eastern Mediterranean	805,808	702,637	2,036,397	3,544,842
Western Pacific	534,289	868,941	4,169,466	5,572,696
Inter-regional and other activities	677,837	522,884	400,634	1,601,355
Country programmes undetermined ...	—	500,000	2,500,000	3,000,000
Sub-totals	*7,988,244*	*7,982,899*	*30,946,084*	*46,917,227*
Headquarters				
Advisory Services	108,870	122,780	366,864	598,514
Central Technical Services	6,229	7,500	22,768	36,497
Administrative Services	67,433	71,749	217,120	356,302
Regional offices	107,489	121,142	375,644	604,295
Grand totals	*8,278,265*	*8,306,070*	*31,928,500*	*48,512,835*

The role of WHO in this important undertaking is manifold. Malaria eradication is more than a series of carefully planned technical processes. It is a world-wide social movement. The leadership of this movement and responsibility for its overall planning fall to WHO. The Organisation has furthermore to encourage research, provide advisers, consultants, and other experts to governments, assist in national planning and in the training of local personnel and extend any further assistance that may be required in the organisation and implementation of eradication projects.

It was to meet these responsibilities that the Eighth World Health Assembly, when deciding to adopt the policy of eradication, established a Malaria Eradication Special Account—"MESA"—and authorised the Director-General to seek financial contributions from governments and private sources. To finance eradication programmes in the Americas a similar fund—the Special Malaria Fund—of the Pan American Health Organisation was created.[1]

The Malaria Eradication Special Account and the PAHO Special Malaria Fund are distinct from the regular budget of WHO and the funds provided under the Expanded Programme of Technical Assistance. They are funds to be financed through voluntary contributions from governments, and by gifts and grants from foundations, industry, labour organisations, institutions and the general public.

The estimated expenditure for the malaria eradication operations planned to be financed from the Malaria Eradication Special Account and the PAHO Special Malaria Fund for the period 1958-1962 has been presented in Table 2.

These sums will make possible, *inter alia*, the mobilisation of a dynamic army of administrators, malariologists, entomologists, various other experts, technicians, etc., to fight with devotion and determination against the ancient curse of malaria. In some instances material aid will also be supplied to obviate delay and the consequent waste of skill and time.

After 1962 the budgetary requirements for malaria eradication will diminish yearly. Moreover, from then on the financial burden will be shared among a much greater number of nations as it will be in the interest of countries freed from malaria to help others to achieve eradication. An obvious form for their contribution will be provision of skilled staff no longer necessary for eradication activities in their own countries.

At present funds for the Malaria Eradication Special Account and the PAHO Special Malaria Fund can be raised only in the economically more developed countries. WHO is confident that these countries and their institutions will appreciate the urgency of the need to supplement the efforts made by less privileged countries to free themselves—and the world—from malaria. Today malaria is everybody's business, and to rid the world of it a common effort must be made.

[1] The Pan American Health Organisation (PAHO) serves as the WHO Regional Organisation for the Americas.

The capital invested in eradication programmes will be regained in a few years. And once eradication is achieved, the world community as a whole, richer as well as poorer members, will benefit.

NOTES AND NEWS

Central Repository for Medical Credentials

The World Medical Association initiated a Central Repository for the protection of medical credentials of all those interested in this service. The Repository became available on July 1, 1958 and is open to every doctor who is qualified to practise medicine.

The credentials warranting protection are:

1. Transcripts of pre-medical and medical school records;
2. Medical school diploma;
3. Registration certificate—state or national boards;
4. Certificate of speciality (ies);
5. Advanced education or honorary degree diplomas.

The Repository will accept medical credentials in the following forms;

1. Photostatic copy of original;
2. Microfilm copy of original;
3. Authenticated copy of original;
4. Official medical school transcripts;
5. Originals.

The application, credentials and identification papers signed in the presence of a qualified witness must be transmitted to the World Medical Association through the member of national medical association. The special application and identification forms may be obtained from the general secretariat of the member associations.

The Headquarters Secretariat of the World Medical Association is responsible for the administration of the Central Repository Service and requests for information may be addressed to it.

International College of Surgeons to Sponsor World Postgraduate Tour

The International College of Surgeons announced that it will hold its fourth around-the-world postgraduate refresher clinic tour in the late Fall. Dr. Edward L. Compere of Chicago, President of the United States Section, I.C.S., will be the coordinator of medical activities.

Departure will be by plane from San Francisco, October 10. The tour participants will take in specially arranged meetings of I.C.S. Sections in Tokyo, October 18-19; Hong Kong, October 29-30; Bangkok, November 2; Tel Aviv, November 20; Istanbul, November 24, and Athens, November 27.

Sightseeing trips have been arranged for these and other countries, including Thailand, India, Ceylon, Egypt, Lebanon, and Jordan.

For further information, write to the Secretariat, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

International Post-graduate Medical Course in Carlsbad

With the XVIII Course, which was held in Carlsbad in 1957, the Czechoslovak Physiatric Society resumed the old and good pre-war tradition of these Carlsbad Courses. This Society is organising the XIXth International Post-graduate Medical Course again in Karlovy Vary, Carlsbad, the world-famous spa with a tradition of 600 years from September 14th to 19th, 1959.

The main themes of this course will be Gastric Diseases and, in addition, free themes from different branches of medical science. Papers will be read by leading research workers from Belgium, Bulgaria, England, Egypt, Finland, France, Germany, Hungary, Italy, Poland, Rumania, Soviet Union, Sweden and Czechoslovakia. The official languages are English, French, Russian, German, Slovak and Czech. There will be simultaneous interpreting to and from these languages.

For application and inquiries please apply to the Czechoslovak Physiatric Society/Albertov 7, Prague 2, Czechoslovakia.

Blood Bank, Calcutta

During the year 1958 the Blood Bank, Calcutta, supplied 28,275 bottles of blood as compared to 24,900 bottles in 1957 and 21,823 bottles in 1956. Out of those who came to donate blood, 1,133 individuals were found medically unfit.

A six weeks training scheme was introduced since 1956 for imparting training in blood transfusion work and its therapeutic aspects to private practitioners. The training is free of charge. Uptill now 63 doctors have been trained.

Apart from supplying whole blood, Bank also supplied 'Plasma' and 'Packed cells'. During the year 1958, 368 bottles of plasma were supplied.

Considering the volume of work that is being done and the number of bottles supplied the Blood Bank may be considered the biggest in Asia.

Medical Research Promotion

The Government of Bombay has created a medical research fund by depositing Government securities of the value of Rs. 30 lakhs. The interest to the tune of about Rs. 1,20,000 accruing from the fund is proposed to be utilised for the various research schemes of the Medical and Public Health Department.

The Government has also constituted a State Medical Research Board under the chairmanship of the Minister of Health for utilising the fund. The other members of the Board are Dr. Jivraj Mehta, Minister for Finance; the Deputy Minister for Health; the Surgeon-General with the Government of Bombay; the Director of Public Health; the Director of Ayurved; the President, Indian Medical Association, Bombay Branch; six representatives of university medical faculties; the Director of the Indian Cancer Research Centre, Bombay; Dr. C. G. Pandit, Director, Indian Council of Medical Research; Dr. Nath, Head of the Bio-Chemistry Department, Nagpur University; the Secretary to the Government of Bombay, Local Self-Government and Public Health Department or his representative; the Director, Haffkine Institute (Ex-officio Secretary).

The Board will allocate available funds for giving grants for medical research. It will also select candidates for such grants and research schemes for lump sum grants.

The Board, a fully autonomous body, will have powers to appoint reference and special sub-committees, if found necessary.

The Secretariat of the Board will be located at the Haffkine Institute, Bombay.

Government Hospital in Chittoor

Mr. Mehdi Nawaz Jung, Minister for Co-operation, Andhra Pradesh declared open a children's ward and also switched on the newly installed x-ray equipment in the Government Headquarters' Hospital, Chittoor, at a public function held in the hospital premises on 18-4-59.

The children's ward was newly constructed at a cost of Rs. 18,200 with a provision of 12 beds at this stage. With the aid of the Government of India, the tuberculosis clinic has been specially equipped with a 150 M.A. x-ray plant with an Odelca camera attachment.

Dr. Prasad Urges Doctors to Fight Leprosy

The President, Dr. Rajendra Prasad, appealed to doctors and social workers in the country to come forward in ever-increasing numbers to work for control of leprosy.

Addressing the annual general meeting of the Hind Kusht Nivaran Sangh in New Delhi, he said : "I attach the highest importance to your work, not only because we need the kind of work you do but also because it creates in us the spirit of service which is absolutely necessary for the uplift of the country."

Rajkumari Amrit Kaur, chairman of the governing body, said the terror of the disease had definitely decreased. Compulsory segregation was fast being abolished and the leprosy patient was no longer inevitably linked up in the public mind with a leprosy home.

She said that 72 centres had been established in the country so far, covering a population of over 86 lakhs and treating about a lakh patients. A sum of Rs. 11,12,540 was given to the State Government as the Central Government's share of expenditure on the leprosy scheme during 1957-58. Grants-in-aid amounting to Rs. 4,83,900 were given to voluntary institutions.

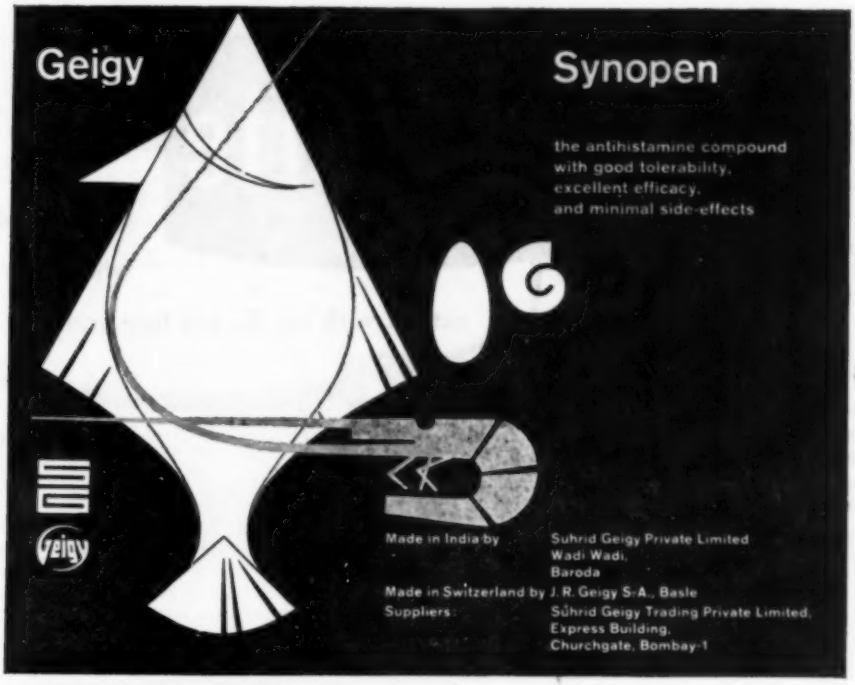
Cancer Hospital in Hyderabad

The Union Finance Minister, Mr. Morarji Desai, laid the foundation for the Radio-Active Cobalt Therapy Building in the Cancer Hospital on April 13, 1959. The Cobalt unit will be given by Canada under the Colombo Plan.

The building, which will be constructed from funds collected by the Indian Conference of Social Work, Andhra Pradesh Branch will cost about Rs. 1 lakh.

Eradication of Malaria in Bombay

House-to-house visits have been arranged as part of the malaria eradication drive, in over 4,000 villages in all parts of Bombay State by the workers of Bombay



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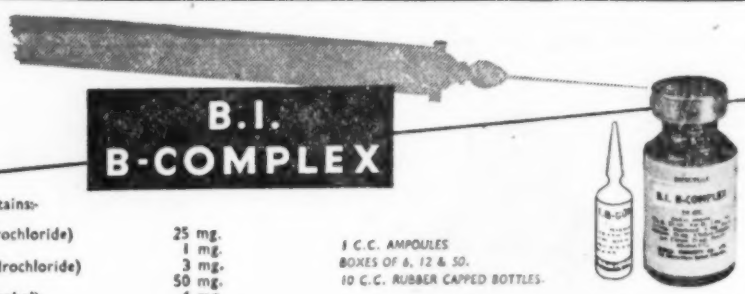

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Panthenol (d-pantothenyl alcohol)		20 mg.
Choline Dihydrogen Citrate		500 mg.
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State Public Health Department. The workers will personally contact at least 4,00,000 individual householders to explain to them the aims and methods of the malaria eradication programme which has been launched in the country.

The drive represents the first phase of a comprehensive programme of health education in connection with malaria eradication. Before the spraying work starts, the drive will be extended to all villages in the State.

More Non-official Effort Needed to Fight Tuberculosis

Presiding over the 20th annual meeting of the Tuberculosis Association of India in New Delhi, Rajkumari Amrit Kaur said that though in a welfare State the main responsibility for the health services was the Government's, it would take a very long time to achieve this goal. But even in a welfare State where the Government might provide for every service, there was no doubt that humanity would be the poorer if men and women did not get opportunities to fulfil their desire to help their fellowmen. It was non-official effort that allowed man to seek his salvation through dedicated service. Welfare organisations were, therefore, in a key position to provide such aspects of human needs as could not be adequately provided by Government agencies.

The TB Seal Sale Campaign, she said, had considerably helped to make the public more conscious of the tuberculosis problem. But the campaign had not maintained the steady progress which was anticipated. She said there was no reason why tuberculosis associations should not enthuse everyone to subscribe once a year five or ten naye paise in support of this great cause. Normally, the seal collections should sustain non-official organisations as was being done in other countries. She pleaded that the position should be studied to find how this drive could be intensified and made the real pivot of a whole nation's movement against tuberculosis.

Madras Medical Council

At a general business meeting of the Council held on March 23, 1959, Dr. T. S. Balasubramanian was elected as vice-president for the current year.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

National Malaria Eradication Programme

SIR,—You are aware that the Government of India have launched a nationwide Malaria Eradication Programme from April, 1958. The programme envisages eradication of malaria from India by intensive spraying of insecticides and treatment of residual cases by drugs. The approved Malaria Eradication Programme is briefly as under :

Attack Phase (1958-59 to 1960-61) :

In this phase intensive spraying of insecticides is envisaged in every human habitation and cattle shed for 3 years in the hypermesoendemic areas and for two years in hypoendemic areas. 230 Malaria Control Units, each unit designed to afford protection to one million people, will operate for 3 years from 1958-59 to 1960-61 and another 160 hypo-endemic units will operate for 2 years during 1959-60 and 1960-61. The scale of insecticides has been fixed at 71 tons of DDT 75 per cent per endemic unit per annum, and 35·5 tons per hypo-endemic unit per annum.

The spraying equipment and field staff is to be reinforced to ensure complete coverage.

B. Consolidation Phase (1960-61 to 1963-64) :

After intensive spraying of insecticides for the required period, the spraying operations will be interrupted provided certain criteria adopted for this purpose are found to be satisfactory. A surveillance organisation will start functioning one year in advance of the interruption of spraying and will continue for a period of 3 years after interruption of spraying operations. Thereafter, the surveillance will become the responsibility of the normal public health staff. It is intended to establish 390 surveillance teams attached to the 390 units. Each team is to have 100 surveillance workers from the year 1960-61. Each surveillance worker will be assigned about 10,000 population and he will be required to visit every house in the area assigned to him once a month or once a fortnight as the case may be, record all fever cases at the time or in between two visits, make blood smears from them and administer a single dose treatment of one of the 4-aminoquinolines. All positive cases will be followed and administered a course of radical treatment. The spray-men from the units will be withdrawn when spraying operations cease.

The question of diagnosis and reporting of malaria cases will assume considerable importance as the programme reached its last stages as during the surveillance period stress is to be laid on detecting the residual foci of infection and eliminating the same by administration of potent antimalaria drugs like 4-aminoquinolines to suspect malaria cases, epidemiological investigation of positive malaria cases and treatment of all confirmed malaria cases with 8-aminoquinolines.

You will agree that the co-operation of the medical profession whether in Government service or in private practice is essential at this stage of the programme. This view was endorsed by the Central Council of Health and at its meeting held in Shillong in January 1959, it was recommended that such co-operation may be secured through the good offices of the Indian Medical Association. I am, therefore, addressing this letter to you with the request that a circular letter may kindly be issued to all your branches and through them to all members of the Medical Association to extend their full co-operation to the malaria staff. Whenever any malaria cases come to their notice these should be microscopically diagnosed and all confirmed cases reported to the nearest Malaria Officer. Where facilities for such diagnosis are not available, the local malaria organisation will offer this service. I am etc.

B. A. RAO,
Director, National Malaria Eradication Programme.

REVIEWS

Leistungen und Ergebnisse der neuzeitlichen Chirurgie—Emil K. Frey zum 70. Geburtstag 1958. XII, 339 Seiten, 154 Abbildungen, 52 Tabellen, Lex.-8°, Ganzleinen DM 84.

Achievements and Results of Modern Surgery—Emil K. Frey to his 70th Anniversary.

This fine volume, full of interesting contributions by his pupils, assistants and colleagues, bears witness to the high esteem and even veneration that Prof. Frey enjoys not only among surgeons and not only in Germany but also among physiologists, pharmacologists and physicians in Switzerland, Sweden, Egypt and Japan, from where some of the papers are coming. The wide variety of the papers reflects the wealth of subjects in which E. K. Frey, director of the Surgical Clinic, University of Munich, until he completed 70 years of age, became a pioneer or a master. More than 40 years ago, as an army surgeon during the First World War, he introduced the primary suture of open brain injuries, simultaneously with Barany and Cushing; as Sauerbruch's assistant he discovered kallikrein in the urine which led to the development of padutin, that benefited so many sufferers from peripheral circulatory disturbances, and as the director of the premier German surgical clinic, at Munich, he achieved such a mastery of chest and, particularly, of heart surgery that in 1956 he published with Kuetgens a "Surgery of the Heart" which has become a classic already. An encouraging sign that time heals even some of the wounds inflicted by the Nazis is the warm tribute which Prof. Rudolf Nissen, Basel, once forced by anti-Jewish legislation to leave Sauerbruch's clinic, pays to the personality, the character and the life work of his older colleague, whose immaculate ancestry enabled him to stay on.

The contents have been arranged in 7 chapters, each consisting of 3 to 8 papers. General surgery and anaesthesia are followed by 60 pages on blood supply, dealing mainly with various aspects of kallikrein-padutin; neuro- and chest surgery, oesophagus and abdominal surgery, urology and a chapter on orthopaedics are the headlines which point to the rich and palatable fare which this birthday present offers. Numerous tables and excellent illustrations increase substantially the pleasure of studying this book. Its external appearance is aesthetically as satisfactory as its substance is intellectually.

Die medikamentöse Behandlung der Schilddrüsenerkrankungen—Von Prof. Dr. W. Grab, Giefien und Prof. Dr. K. Oberdisse, Düsseldorf. 1959. XII, 285 Seiten, 55 Abbildungen, 14 Tabellen, Gr.-8°, (Georg Thieme Verlag, Stuttgart), Ganzleinen DM 39.60.

The Drug Treatment of Thyroid Diseases—By Prof. Dr. W. Grab, Director, Pharmacol. Inst., Justus-Liebig-University, Giessen, and Prof. Dr. K. Oberdisse, Director, II. Medic. Clinic and Policlinic, Medic. Academy, Düsseldorf (in German).

The great advances in the diagnosis and treatment of pathological conditions of the thyroid gland called for a detailed review of the present position, especially as a number of masked, often overlooked thyrogenic diseases, such as monosymptomatic hyperfunctions and gradually developing hypofunctions can be more exactly diagnosed and more effectively treated now than a few years ago. It is particularly welcome that a therapeutic subject of considerable importance has been dealt with within one monograph by a pharmacologist as well as by a clinician of repute, so that every practical consideration is seen against the proper experimental background and the laboratory findings are shown to be practically significant and applicable.

Part I, written by Prof. Grab, deals with the pharmacological basis of thyroid therapy. Physiology of the normal and pathophysiology of the diseased thyroid are clearly and exhaustively discussed, including the iodine cycle, fundamental effects of the thyroid hormones and effects of the normal and pathological thyroid on the whole organism. The next section outlines in detail the effects of hormones, iodine, chemotherapy, antithyroid drugs, general means, etc., on diseases of the thyroid. Then follow a few short hints about methods of estimating the protein-bound and the butanole fraction of iodine, thyrotropine, thyroxin, cholesterol, etc., but they are not meant to replace a laboratory manual. They are given in much greater detail in the first 20 pages of the clinical part, where also the diagnostic applications of radio-iodine, including its decisive role in localisation of pathological areas are uroperly discussed. Chapters on hyperthyroidism, malignant exophthalmos, the various forms of thyroiditis, malignancy, goitres, and hypothyroidism are fully described. Although recently several excellent English works on the thyroid have been published, this concise treatise with its dual aspect that gives the pharmacologist sufficient clinical information and *vice versa*, should prove interesting to both, including students and practitioners.

Klinische Methoden der Blutgerinnungsanalyse—Von Prof. Dr. J. Jürgens, Frankfurt/M., und Doz. Dr. F. K. Beller, Tübingen. Mit einem Geleitwort von Prof. Dr. M. Gänsslen, Frankfurt/M. 1959. XII, 408 Seiten, 104 Abbildungen, Gr.-8°, (Georg Thieme Verlag, Stuttgart), abwaschbarer Plastikeinband DM 56.

Clinical Methods of Blood Coagulation Analysis—By Prof. Dr. J. Jürgens and Doz. Dr. F. K. Beller with a preface by Prof. Dr. M. Gänsslen (in German).

This book gives more than the title promises. The stormy development of the biochemical aspects of blood coagulation opened a wide gap between laboratory potential and bedside practice. In an attempt to close it, this monograph was written as a result of close cooperation between Prof. Jürgens of the II Medical University Clinic, Frankfurt, and Doz. Beller of the Univ. Gynaec.-Obstetric. Clinic, Tuebingen, both of whom have worked for many years on problems of blood coagulation. To impart full information about the methods of coagulation analysis and their applications, they had to give some clinical background of haemorrhagic diatheses, anticoagulant therapy and related subjects,

which they did in a most instructive way. The first part deals with physiology and clinic of blood coagulation. The second main section is devoted to the methods of investigating the vast coagulation system. They are described in detail in separate chapters on thrombocytes and their function; estimation of plasma factors, according to the various phases; estimation of fibrinogen; the fibrinolytic system; inhibitors of blood coagulation; global coagulation time; retraction; calculation of coagulation factors; analytical procedure for revealing the causes of haemorrhagic diseases, and heparin estimations. The last 30 pages contain instructions about methods of preparing all the items required for carrying out the previously described investigations and the necessary laboratory reagents. At the end of every chapter are arranged numerous references to literature in German, English, French, Italian, Scandinavian languages, Finnish, etc. They are running into thousands, so that merely as a reference work this book is invaluable. Its true excellence could be appreciated only by a specialist in blood coagulation, a subject which daily gains in importance, as not only haematologists but also surgeons gynaecologists, obstetricians, physiologists and many other branches of medical scientists must take cognisance of this steadily growing structure of living knowledge. As only such methods have been included which have been found completely reliable or useful for quick bedside diagnosis, this elegant volume, bound in a particularly attractive flexible plastic material, should prove indispensable in the haematological laboratory.

A Short History of Anatomy and Physiology from the Greeks to Harvey—By Charles Singer. Published 1957, by Dover Publications, Inc., 920 Broadway, New York 10, N.Y., U.S.A. Paper bound, 8″×5¼″, 209 pages; price $1.75.

This new "Dover" edition is an unbridged republication of the first edition of a classic work on the history of anatomy and physiology, originally published under the title *The Evolution of Anatomy*. In a new preface for this edition, the author writes (in May 1956): "The literature in English is now more copious than it was when the first edition was published even thirty years ago." He hopes that this new edition may turn the attention of his readers to these currently available works of masters like Vesalius, Galen, Coiter, Monolino, Leonardo and others. This book traces the evolution of anatomy from prescientific times through the Greek and Roman periods, the Dark Ages, and the Renaissance, up to the age of Harvey and the beginning of modern scientific concepts. This entire coverage is considered in four big chapters; the first from the Greeks to 50 B.C., the second from 50 B.C. to 1050 A.D., the third from 1050 to 1543 A.D., and the fourth from 1543 to 1628 A.D. The final section is concerned with Vesalius as artist, humanist and naturalist; with a discussion of his *Fabrica;* and with his rivals and followers up to Harvey. A Vesalian atlas, at the end, contains nudes, skeletons and muscle tabulae from the *Epitome* and the *Fabrica*. This is really an excellent book of its kind.

1. **Tumors of the Skin**—By Herbert Z. Lund, M.D.

2. **Tumors of the Oesophagus**—By Arthur Purdy Stout, M.D. and Raffaele Lattes, M.D.

3. **Tumors of the Liver and Intrahepatic Bile Ducts**—By Hugh A. Edmondson, M.D.

Published by the Armed Forces Institute of Pathology. Paper cover in loose-leaf system, 10¼″×7¾″; pages 330, 104, and 216 respectively. For sale by the American Registry of Pathology, Armed Forces Institute on Pathology, Washington 25, D.C., U.S.A. Price $3,00, $1.00, and $2.25 respectively.

These three volumes belong to the well-known series of books under the group "Atlas of Tumor Pathology", started several years ago, and now being published, sponsored and supported by the American Cancer Society, Anna Fuller Fund, Armed Forces Institute of Pathology, Jane Coffin Childs Memorial Fund for Medical Research, National Cancer Institute, U.S. Public Health Service; and the United States Veterans Administration. Each of these volumes, produced, as the result of co-ordination and co-operation of these organisations, has really been worth so much, and is a masterpiece of collaborative production. With a very large number of reproductions of naked-eye and microscopical appearances, many in colour, reading and assimilation becomes a pleasure. The depiction of such large numbers of photographic and microphotographic representations, along with appropriate captions therewith, has enabled the purely descriptive text to be reduced to a minimum, much to the enhancement of the appeal of each volume.

The Practice of Sanitation—By R. S. Hopkins and W. H. Schulze, published by the Williams and Wilkins Company, Baltimore, U.S.A. Illustrated, p. 487, price $8.00.

It has to be admitted that the life expectation in the Western world has greatly improved within the last 70 years due largely to the improvement of environmental sanitation which has not only come out of better knowledge but also of the better and more conscious applications.

A vast field for action still remains unattended in this country particularly in the rural areas. Insects- and rodent-borne diseases are highly prevalent and much is yet to be done in regard to the provision of the safe water supply and disposal of night-soil. As such environmental sanitation forms an important subject of curriculum of both under- and post-graduate medical and engineering studies. A good book on the subject is therefore an asset to the students and the teachers alike.

The authors of the present volume deserve to be congratulated for covering such a wide and complex subject in a concise and lucid manner within eleven chapters. They have discussed the general principles of sanitation relating to different environments without giving too much details on design, and constructional and operational features of these establishments. The

chapters on food sanitation, sanitation of eating places and milk and milk products have been very well discussed with greater details than the rest. The bibliography at the end of each chapter provides adequate reference materials to the interested readers.

The chapter on sanitary survey gives some useful tips for conducting surveys of the physical environment in relation to health of the community.

The volume provides very useful reference material to public health workers, particularly the health officers, nurses, sanitarians, etc. and should be popular with both sanitary engineering and post-graduate medical and public health students.

OBITUARIES

Dr. B. K. Dasgupta

Born in September 1906, Dr. B. K. Dasgupta had his early education at the high school at Shillong. After passing the I.Sc. examination from the Bangabasi College, Calcutta, in 1925, he joined the Medical College, Calcutta, and graduated in 1931. After graduation, he worked as a House Surgeon, in the Eye Infirmary of the same institution for about 2 years. He then went to U.K. for higher studies and obtained the Diploma in Ophthalmology from Oxford and London, and became a Fellow of the Royal College of Surgeons, Edinburgh.

DR. B. K. DASGUPTA

Returning home in 1939, he joined the Campbell Medical School (now N. R. S. Medical College) as an Additional Associate Ophthalmic Surgeon in 1940 and worked as the Junior Visiting Surgeon in the Calcutta Medical College in 1943. In August 1947, he became an Hony. Senior Surgeon. He was appointed Professor of Ophthalmology, Medical College, Calcutta, in 1948 and continued in that capacity for about four years. Subsequently he joined the N. R. S. Medical College as Professor of Ophthalmology and remained there until his death.

In recent years, a number of papers published by him received international recognition, and some of his works were incorporated in authoritative text-books of ophthalmology. He was an examiner in M.S. (Ophthalmology) and M.B.B.S. of several universities of India. He was closely associated with the Ophthalmology Society of India and Bengal where his scientific activities were highly appreciated.

He was very much loved and respected by his colleagues, students and patients. He was in indifferent health for some time, but of late, he had been improving steadily.

Dr. Dasgupta breathed his last on January 11, 1959 at about 1 A.M.

He leaves behind his widow, two minor children, his old mother, several brothers and sisters and a host of friends and admirers to mourn his loss.

Dr. P. Sanjeeva Rao

Dr. P. Sanjeeva Rao came to Coonoor on 18-5-55 as a Medical Officer of Government Lawley Hospital, Coonoor. Ever since his arrival at Coonoor, he strove hard day and night in the service of the sick. His surgical skill enhanced the reputation of the hospital to a great extent. He was extremely popular amongst the staff and patients of the hospital. As a member of the Nilgiri District Branch of Indian Medical Association, he evinced a very keen and lively interest and on very many occasions gave illuminating and instructive talks which were full of his valuable experiences. The untimely demise of this young, popular and respected member of the Indian Medical Association on 24-2-59 at the early age of 42 has created a void which is difficult to fill.

DR. P. SANJEEVA RAO

SUPPLEMENT
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BRANCH NOTES

AKOLA BRANCH—The secretary of the branch informs all concerned that the publication of the Brochure compiling lectures of the Refresher Course, Akola, is being delayed. However it is expected that the subscribers of the Refresher Course will receive their copies of the Brochure by the end of May 1959.

A meeting of the branch was held on 11-4-59. Cases demonstrated and discussed were (1) Rheumatic Pericarditis with Effusion, (2) Venous Thrombosis, (3) Myopathy treated with B_{12}, (4) Alkaptonuria, (5) Renal Calculi Pelvis treated with Nephrolithotomy, (6) Fracture Tibia and Fibula treated with Intramedullary Nailing, (7) Hydatid Cyst.

ANAMALLAI BRANCH—The monthly clinical meeting was held on 17-1-59. Dr. M. K. R. Jayachandran presided. Dr. M. D. Dissawala gave a talk on Do's and Dont's in Obstetrics.

A meeting was held on 28-2-59. Dr. M. K. R. Jayachandran presided. Dr. Subbanna gave a talk on Appendicitis. The hony. secretary spoke about the Annual meeting Day Celebration to be held in April 1959.

ANDHRA PRADESH BRANCH—The annual report of the branch for the year 1957-58 shows that 33 branches with 1,224 members functioned when this branch came into existence in November 1957. In April 1958, a new branch, Gudivada with a membership of 20 was formed. The medical examination of University students was being continued this year as in the previous year. Three Working Committee meetings and 1 extraordinary Provincial Council meeting were held during the year. As usual the Arastu Memorial lecture for the year was conducted, the lecturer was Dr. P. M. Udani of Bombay. The annexe and the room adjacent to the staircase of the I.M.A. building was named after the late Dr. Gurumurthy. The library improved.

BAREILLY BRANCH—The 2nd Rohailkhand Kumaon Zonal Medical Conference was held at Bareilly on 8-3-59. Dr. G. V. Kabraji, vice-president, U.P. State Branch, inaugurated the conference. One hundred and fifty-four delegates from the branches, Sahjhanpur, Baduan, Aonla, Moradabad, Rampur, Baheri and Kashepur attended. A symposium on Ischaemic Heart Disease was held under the presidentship of Col. H. B. Lal.

BELLARY BRANCH—A clinical meeting of the branch was held on 4-4-59 with Dr. J. J. Dharmaraj, D.M.O. in the chair. Dr. V. Seena spoke on Venereal Diseases. Dr. Dharmaraj initiated discussion on I.M.A. Building plan which was approved.

BHUBANESWAR BRANCH—The annual general meeting of the branch was held on 11-12-58. Brigadier B. D. Khurana presided. Eight members were present. The annual report of 1957-58 and the annual accounts were adopted. Office-bearers for 1958-59 were elected with Brigadier B. D. Khurana as president, Dr. D. R. N. Sahu as vice-president, Dr. K. C. Roy as hony. secretary, Dr. P. C. Pattnaik as joint secretary and Dr. G. D. Mohapatra as treasurer. The Committee then discussed the question of collection of funds in connection with B.C.G. Flag Day, T.B. Seals etc. and decided to hold one Health Week in the year.

BIJAPUR BRANCH—The annual conference was held on 21-12-58. Dr. G. N. Mangalvedhekar was in the chair. Dr. B. S. Jirge from Belgaum was the chief guest. Dr. S. B. Patil, chairman of the Reception Committee welcomed the delegates and gave a short history of Bijapur. The Chief Guest gave a talk on Circulatory Inefficiency and Coronary Occlusion and showed many ECG plates. Dr. Mangalvedhekar thanked the Guest. The secretary explained the purpose of the Conference.

On 23-2-59, a meeting was held. Dr. K. G. Kulkarni who attended the Refresher Course at Mysore gave his impressions and information regarding the course. Fifteen members were present.

BOMBAY WEST SUBURBAN BRANCH—A monthly general meeting was held on 1st March 1959. Dr. S. C. Sheth was in the chair. 35 doctors were present. Dr. S. M. Pradhan gave a talk on his tour impressions of U.S.S.R. and showed many interesting slides of Moscow an Leningrad. By courtesy of Indosoviet Cultural Society two scientific films (1) At the source of truth (Pavlov Institute) and (2) Children's Rural Health Centre were shown. By courtesy of Consul General of Switzerland films (1) Under the blue skies, (2) Easy to love and (3) Bicycle Race cartoon were shown.

A managing committee meeting was held on 1st March 1959.

An educational excursion was arranged on 22nd March 1959 to the famous "National Rayon Corporation Ltd." factory at Kalyan and a thousand year old Shiv temple at Ambernath. About 90 persons composed of 40 doctors and their family members joined this enjoyable trip to Kalyan and Ambernath about 40 miles away from Bombay.

The monthly general meeting was held on 5-4-59. Dr. T. P. Vyas presided. Twenty-three doctors were present. Dr. K. S. Masalavalla spoke on Deformities caused by Rickets and their Management with the help of slides and photographs.

CUTTACK BRANCH—An ordinary and another extraordinary meeting of the branch was held in March 1959. Dr. M. Khadanga, Asst. Professor of Orthopaedic Surgery, spoke on the Management of Fractures. A sub-committee for the selection of site for the building of I.M.A., Cuttack branch was formed. The meeting supported the demand of the Internees of the S. C. B. Medical College for a suitable stipend. The members supported the non-practising scale of pay of the teaching staff as recommended by I.M.A. A deputation led by Dr. K. N. Misra waited on the Director of Health Services on 19-3-59 and discussed in full the question of pay of non-practising teachers.

DAVANGERE BRANCH—A clinical meeting was held on 12-4-59. Dr. C. Bhasyam of Government Hospital presided. Dr. Felix Misquith of New York spoke

on E.N.T. Diseases in general practice and their treatment.

DHAKURIA BRANCH—A general meeting of the branch was held on 3-2-59. Dr. A. C. Sen Gupta, the secretary of the branch, narrated his experiences of the Cuttack Conference. Various organisational matters were discussed.

DHANBAD BRANCH—Health Week was inaugurated on 20-2-59 at the Rajgunj High School by Sri R. P. Khanna, I.A.S., Deputy Commissioner, Dhanbad. Dr. M. M. Saha, president of the branch, presided over the function. Dr. (Major) H. C. Mallik, President, Bihar State Branch, attended as the Chief Guest. About 2000 people attended. Lectures were given on Balanced Diet, Drinking Water, its problem and remedy, Family Planning, Malaria and Prevention of communicable diseases etc. The second day was also devoted to lectures on preventable diseases. The meeting was held at Charki Pahari. In the third day the deliberation was held at the Creche building of Pootki Colliery. Besides lectures, a baby show was held and prizes were distributed. Health Week meetings were held on the 23rd, 24th and 25th February 1959 at Bagmara Village, Debiana and Radhanagar. The last day's celebration was held at Jugidhi and eminent persons spoke on subjects related to health. Refresher Course lectures were held on 22-2-59. Throughout the health week, the health of a large number of students was examined. Sri Niranjan Sarkar of Dhanbad School won 1st position in class I competition of the Bihar Sree at Patna.

In a meeting held on 8-4-59, the members of the branch condoled the death of Dr. A. K. Roy Chowdhury and Dr. Ranajit Sinha of Calcutta.

ERODE BRANCH—A meeting of the branch was held on 6-2-59 with Dr. R. S. Venkatraman in the chair. Dr. K. A. Krishnamurthy, District Medical Officer, Coimbatore, spoke on Nephritis in Children. Twenty-six doctors were present.

In a meeting held on 9-3-59, Miss Georgine Boyd from New Zealand spoke on Diet and Health. Twenty-eight doctors were present.

Dr. Y. P. Vasudevan, vice-president, I.M.A. (Central), addressed the members on Activities and Achievements of the I.M.A. Collections for I.M.A. Building Fund (Central) were made in the meeting.

FARRUKHABAD-CUM-FATEHGARH BRANCH—The Annual Day function was celebrated on 16-3-59. Dr. C. B. Singh, Principal, Medical College, Kanpur, presided over the function and Dr. H. N. Shivapuri, ex-president, U.P. State Branch was the Chief Guest. Dr. R. K. Jalota of Kanpur spoke on the Modern Treatment of Coronary Thrombosis, Dr. S. P. Saksena on the therapeutic value of Hypnotism. Dr. C. B. Singh stressed on the early diagnosis of Cancer in the aged, Dr. Shivapuri appealed for membership drive and contribution to Building Fund.

GHUGUDANGA BRANCH—A meeting of the branch was held on 22-2-59. Ten members were present. Dr. S. Sarker presided. Letters and circulars from the Central and the Bengal Provincial branch were discussed. There was a discussion for the purchase of a medical hall in the locality for the co-operative medical stores.

A meeting was held on 23-3-59. Dr. S. Sarker presided. Dr. T. N. Chowdhury and Dr. K. Ganguli were requested to frame laws and bye-laws for the co-operative medical stores for registration. The difficulties in private practice was discussed among the members.

GIRIDIH BRANCH—The members of the branch met on 1-4-59 and condoled the death of Dr. A. K. Roy Chowdhury of Calcutta and a suitable resolution was passed.

HASSAN BRANCH—The clinical meeting of the branch was held on 21-3-59. Dr. B. N. Krishnamurthy presided. Twenty-two members were present. Dr. N. Leela Bai spoke on Disorders of Menstruation. Dr. Giri Gowd demonstrated 2 cases, one of Achondroplasia and the other of Rickets. Dr. B. S. Jaganath read a case report on Toxaemia, Dr. Anne Gowd on Liver Abscess.

HINGALI BRANCH—A meeting of the branch was held on 7-4-59 to celebrate the World Health Day. Dr. B. D. Deshpande was in the chair. A discussion was held on "Mental Illness and Mental Health". Dr. Kandalikar, opening the discussion, defined the term Mental Illness. Dr. Purohit reported a case of a 3 years' mentally deficient child. Dr. Bhale referred to Senile Psychotic patients and reported 5 different cases he treated. The president summarised the various aspects of mental diseases and said that private practitioners have got very limited scope to deal with such cases.

JADABPUR BRANCH—The members met on 4-3-59 and condoled the death of Dr. A. K. Roy Chowdhury of Calcutta by a suitable resolution.

JALPAIGURI BRANCH—The members of the branch met on 12-4-59 and condoled the death of Dr. A. K. Roy Chowdhury and of Dr. R. Sinha of Calcutta.

KARIMNAGAR DISTRICT BRANCH—The monthly clinical meeting of the branch was held on 29-3-59 with Mohd. Gulam Nabi in the chair. The District Medical Officer, Karimnagar demonstrated a case of Subperitoneal Fibroid which was successfully operated by him. Another case of an Abdominal Tumour which was cystic in nature was demonstrated. A third case of Carcinoma of Colon was also demonstrated. Dr. K. N. Waghray, Asst. District Medical Officer of Karimnagar, demonstrated a case of Dilatation of Heart (left ventricular failure).

KHAMGAON BRANCH—A report of six month's activities of the branch shows that four scientific subjects were discussed and a number of cases demonstrated. On the occasion of the celebration of World Health Day on 7-4-59, two members of the branch spoke. Three members of the branch attended the Refresher Course held at Akola.

KHAMMAMETH BRANCH—A general body meeting of the branch was held on 26-10-58 with Dr. Ahmed Hussain in the chair. Dr. Ahmed Hussain spoke on "Role of Collapse measures in Pulmonary Tuberculosis". Elections to the office-bearers of the State Branch were conducted by secret ballot.

A monthly meeting was held on 1-3-59 with Dr. S. A. Majeed in the chair. Dr. D. Rajesekhar Rao of Eluru gave a talk on medicine and health in People's China. Dr. Y. Radhakrishna Murthy presented a case of "Aortic Regurgitation of 6-7 years' duration".

A monthly meeting of the Association was held on 29-3-59 with Dr. Ahmed Hussain in the chair. Some short medical films were shown. Yr. Y. Radhakrishna Murthy presented cases of (i) Rheumatoid Arthritis, (ii) Multiple Cranial Nerve Paralysis in a woman, (iii) Splenomegaly.

KOLHAPUR BRANCH—The annual general meeting was held on 10-10-58. Office-bearers for 1958-59 were elected with Dr. P. B. Bhadre as president. Dr. L. J. Kulkarni as vice-president. Dr. V. G. Gogale as hony. secretary and Dr. A. N. Pardekar as hony. treasurer.

A clinical meeting was held on 3-1-59 with Dr. Kulkarni in the chair. Dr. Donaldson from Miraj gave a talk on Osteo-Articular Tuberculosis.

On 30-1-59, a clinical meeting was held in C.P.R. Hospital, Kolhapur. Dr. Ashtaputre, the Civil Surgeon, Kolhapur showed the following cases: (1) Uterine Adnexa Malignancy, (2) Psoas Abscess, (3) Liver Enlargements, (4) Cretinism.

KOTHAGUDIUM BRANCH—A special meeting of the branch was held on 16-3-59. Eleven members were present. Dr. Rangacharyulu, president, Andhra Pradesh Branch, I.M.A., Dr. Manickyarajn, vice-president, Dr. Vasudev Rao, hony. secretary, Dr. Murthy, hony. treasurer and Dr. Sarma were present in the meeting. Some distinguished colliery officers attended the meeting on invitation. Dr. T. C. Ramchandani delivered a lecture on Scout Films in Acute Abdominal Emergencies, illustrated with x-ray films.

MONGHYR BRANCH—A meeting of the branch was held on 22-3-59 with Dr. K. P. Mitra in the chair. Thirty-six members were present. It was decided to move the Commissioner of Commercial Taxes for compounding the Sales Tax on Chemists and Druggists from 1-4-59 as the village druggists will not be able to maintain an accountant to deal with the intricate accounts. Dr. Bhola Mahton spoke of Tropical Eosinophilia, its diagnosis and treatment.

The health week was inaugurated on 20-2-59 by Pandit Sri Krishna Sinha. The function was presided over by Dr. B. P. Shrivastava. Speeches on health matters were given. Over 2,000 persons were vaccinated at Monghyr. On 21-2-59 physical feats were held and Sri Narendra Mohan Pd. Gupta was selected to be the best. A health exhibition was held in the association hall in which models and charts were exhibited. 'Baby Show' was held on the 3rd day, four hundred babies took part. Many doctors from Monghyr and Jamalpur were present. Prizes were given to the 3 best selected babies. It was decided to send the best baby to Patna for State competition. On the 4th day, school health examination was conducted and it was continued to the 5th day of the health week. On the 6th day sports were held. Forty-five doctors were present. A meeting for mass contact was organised. Dr. T. N. Banerjee who was present spoke on various preventable diseases and gave away the prizes. Later a refresher course lecture was arranged, on differentiation of Angina Pectoris and Coronary Mischief. The last day was devoted to school health examination. Over 550 students were examined.

MORVI BRANCH—A meeting was held on 21-12-58. Dr. C. T. Mehta president. Dr. Miss Rochlani spoke on Sterility.

A meeting was held on 1-1-59 to give farewell to Dr. Miss Rochlani as she was leaving the place for further studies. Dr. S. N. Mankad, past president of Gujarat and Saurashtra Provincial Branch who was present on this occasion, spoke on Humane Aspects of our profession.

A meeting was held on 15-3-59 when Dr. Adhvaryu of Virnagar spoke on Do's and Dont's in Eye Diseases. Dr. C. T. Mehta presided.

A meeting was held on 10-4-59 to give farewell to Dr. Mrs. S. Pushkarna on the eve of her transfer to Khamgaon. Dr. C. T. Mehta presided.

NANDED DISTRICT BRANCH—Office-bearers of the branch for 1958-59 were elected with Dr. Mir Monsikuddin as president, Dr. Shyam Sunder as vice-president, Dr. N. M. Sahasrabuddhe as hony. secretary and treasurer. Dr. G. M. Valvekar as hony. joint secretary.

NELLORE BRANCH—A meeting of the branch was held on 11-10-58 with Dr. S. R. Singh in the chair. Dr. C. R. Rajagopalan gave lecture on Thoracic Emergencies starting from the new-born infant and ending with Chest Emergencies in the aged.

A meeting of the branch was held on 7-11-58. Elections of 1 president and 3 vice-presidents were held. Thirty members were present.

A meeting was held on 1-12-58. The president introduced Dr. S. C. Sen, a past president of I.M.A., to the members. Dr. S. C. Sen spoke about the purpose of his visit viz. to stimulate the collection drive for the fund of the Central I.M.A. Building at Delhi and requested the members to contribute liberally to the fund.

NEW BARRACKPORE MADHYAMGRAM BRANCH—The annual general meeting of the branch was held on 26-1-59 Dr. B. Bramha presided. Office-bearers for 1958-59 were elected with Dr. B. Bramha as president, Dr. K. Majumdar as vice-president and Dr. N. L. Saha as hony. secretary, Dr. S. K. Ghosal and Dr. B. K. Ghosh as joint secretaries and Dr. G. C. Chatterjee as treasurer. The annual report for 1957-58 shows 8 general meetings, 4 clinical meetings and 3 executive meetings were held during the year. Membership increased by 10.

NILGIRI DISTRICT BRANCH—A monthly meeting of the branch was held on 30-1-59 with Dr. T. D. Jeevarathnam in the chair. Dr. J. A. R. Miles, Professor of Microbiology, University of Otago Medical School, New Zealand, spoke on Virus and the Cell. The members condoled the death of Dr. G. Prabhakar, Medical Officer, Nonsuch Tea Estate, Coonoor.

A monthly meeting of the branch was held on 21-3-59 with Dr. H. C. Berlie in the chair. The members condoled the death of Dr. P. Sanjeeva Rao of Government Lawley Hospital, Coonoor. Later Major S. Ramaiah of Military Hospital, Wellington, spoke on "Infections of Hand".

RAFIGANJ BRANCH—The branch celebrated the Health week from 20-2-59 to 26-2-59 which was inaugurated by Shri Radhasyam, Head Master of R. B. R. High School. During the week, refresher course lectures were given by Dr. A. Sinha and Dr. A. K. N. Sinha of Patna. Mass vaccination against smallpox, ACC Rallies, Sanitation Drive, School Health examination, distribution of posters, hand bills, pamphlets, etc. which were in the programme, followed. Prizes were also given.

RANCHI BRANCH—A meeting was held on 4-2-59 to condole the death of Dr. Bimalananda Ray, an old member of the branch at the age of 71 on 27-1-59. Refresher Course lectures on Headache were delivered on 4-2-59 by Dr. R. Prasad, Dr. J. Dubey and Dr. K. D. N. Agrawal at the Sadar Hospital, Ranchi, and a series of cases was demonstrated.

RATLAM BRANCH—A special meeting was held on 3-3-59. Dr. Akbar Ali, Professor of Medicine, M. G. M. Medical College, Indore, who was deputed there for consultation on complicated cases of Ratlam. A talk on aetiology, symptoms, signs and treatment of diseases was arranged.

ROURKELA BRANCH—A meeting was held on 4-1-59 with Dr. R. N. Sahoo in the chair. Dr. S. Malhotra gave a talk on Modern Trends of Obstetrics Practice in the U.K. An Anencephalic monster with various other abnormalties was demonstrated by Dr. U. Bambery.

SAHIBGANJ BRANCH—The health week was inaugurated on 20-2-59, by Sri S. P. Ray, advocate. Dr. G. Bose, secretary of the branch, spoke on the utility of health week. A dance drama depicting a fight between the diseases and health measures by the local girls was highly appreciated. Baby shows, school health examinations, utility lectures and "Sahibganj Sri" competition for the best developed body were held. A rural health conference was held where planned parenthood, health care of school children, and prevention of diseases were discussed.

SALEM BRANCH—The annual day meeting of the branch was held on 29-3-59. Office-bearers for 1959-60 were elected with Dr. Sundaram as president, Dr. S. Kannan as vice-president, Dr. P. K. Chandrapal as hony. secretary, Dr. J. Sugavanam as hony. joint secretary and Dr. K. V. Dhanakoti as hony. treasurer.

SHEGAON BRANCH—A meeting of the members of the medical profession was held on 28-3-59 during the visit of Dr. R. N. Chaudhari, president of Maharashtra Territorial Branch under the presidentship of Dr. Sane of Khamgaon and a branch of I.M.A. was formed at Shegaon. Office-bearers were elected with Dr. Mandeokhot as president and Dr. T. N. Chaudhari as secretary.

SHIMOGA BRANCH—A monthly clinical meeting of the branch was held on 1-2-59. A symposium on Meningitis was introduced by Dr. M. V. Chari of Kasturba Medical College, Bangalore. Case reports were presented, on Fracture Mandible by Dr. Thimmareddy, on Skin Grafting by Dr. T. N. Srinivasaih. Dr. S. Srinivasan and Dr. B. R. Shama Rao participated in the discussion. Dr. D. R. Nanjappa spoke on Emergencies of the Eye. There was a popular lecture on Children's Disease by C. Krishnachari.

A monthly clinical meeting was held on 22-3-59, Dr. B. R. Shama Rao presided. Dr. M. P. Pai of

Victoria Hospital spoke on Newer Trends in Thoracic Surgery and Dr. S. C. Kuppanna of Bangalore Medical Centre spoke on Radiological Aspects of Thoracic Surgical conditions and demonstrated films. Dr. A. D. Paul, Medical Officer, Tirthahalli demonstrated 2 cases of skin grafting, one case of excision of left elbow for T.B. and one case of general peritonitis due to a foreign body.

In the evening, the meeting continued under the presidentship of Dr. D. Shamanna, Dr. R. Shama Rao delivered a lecture on Tuberculosis with specific reference to preventive measures viz. B.C.G. vaccination and isolation of extensive, open and incurable patients in special homes.

SILIGURI BRANCH—In order to give a membership drive, a meeting was arranged at Kamala Tea Estate, about 20 miles from Siliguri. Some of the doctors of the locality promised to be members of I.M.A.

A meeting of the branch was held on 28-3-59. Thirtyeight members were present. Dr. K. M. Guin of Jalpaiguri Hospital spoke about Leucorrhoea and its Management and also of Diagnosis of Ectopic Gestation. It was decided to hold a joint meeting with the public to make them conscious of spreading tuberculosis and the possible measures of prevention.

SHILLONG BRANCH—The annual general meeting of the branch was held on 28-3-59. Thirtyfive members were present. The members condoled the death of Dr. N. G. Kar, a very active member of the branch, on 26-3-59. The secretary's report shows an increase in membership by 9. New office-bearers were elected with Dr. S. Bhattacharya as president, Dr. B. K. Padmapaty and Dr. C. N. Hazarika as vice-presidents, Dr. S. Chaudhuri as hony. secretary and Dr. R. Baishya as joint secretary. The members stressed on the importance of having frequent clinical meetings. The Central Office I.M.A. was requested to move the Union Government to permit Central Government employees of Shillong to receive treatment from private practitioners and be reimbursed on their certification. The members also requested the authorities concerned to hold separate training classes in family planning for private practitioners to enable them to contribute to the efforts of the Government in the implementation of the scheme.

SHOLAPUR BRANCH—An Inter-District conference was held on 8-3-59. About 70 delegates from the districts of Raichur, Gulbarga, Bijapur, Osmanabad and Sholapur attended the conference. Eighty-one members of the branch attended. Dr. G. M. Phadke of Bombay was the chief guest and Dr. R. V. Wardekar, secretary, Gandhi Memorial Leprosy Foundation was one of the main speakers. Thirteen other speakers spoke on various problems in medicine. The outstanding success of the conference lay in the excellent attendance of delegates at the scientific sessions.

SITAPUR BRANCH—The clinical meeting of the branch was held on 28-2-59. Twenty-nine members were present. Dr. S. S. Misra, president of U.P. Branch, I.M.A., attended the meeting on invitation. Dr. Pratap Bahadur presided. Dr. Misra spoke on Modern Trends in Tropical Eosinophilia.

SOUTH ARCOT BRANCH—The monthly meeting of the branch was held on 21-3-59. Dr. A. L. Annamalai of General Hospital, Madras, spoke on Cough, its Signifisance and Management. Dr. M. Natarajan of Stanley Hospital, Madras spoke on Common Skin Diseases and their Management.

TARAKESWAR BRANCH—On 28-12-58, an ordinary meeting was held at Bhandarhat. Thirty-seven members were present. Application of Drug Rules in general practice and difficulties in procuring morphine group of drugs and other valuable foreign drugs were discussed by Capt. P. N. Roy Choudhury, Dr. H. S. Datta and others and summed up by Dr. S. N. Mukherjee who presided. A case of Anencephaly delivered by Dr. S. P. Roy Chowdhury was presented for discussion.

On 25-1-59 a socio-medical conference was held, Dr. B. Das presided. Dr. H. S. Datta was the Chief guest. Thirty-five members and about 100 gentlemen were present. Necessity of co-operation between the public and medical men in improving the health of the country was discussed by Dr. R. K. Goswami, Sri A. Basu Mallik and others. Dr. H. S. Datta discussed "Stunted growth of children due to ignorance of health rules of the public". Dr. Das summed up the relation between the society and medical men.

TIRUCHIPALLI BRANCH—A meeting of the branch was held on 24-1-59, Dr. R. Sambasivan presided. Thirty members were present. Dr. T. V. Venkatesan of Government Erskine Hospital, Madurai, spoke of Clinical Medicine and Therapeutics.

TIRUCHY BRANCH—A meeting of the branch was held on 27-12-58. Dr. G. Viswanathan presided. Thirty members were present. Dr. M. V. Krishna Moorthy, District Medical Officer, Coimbatore, delivered a lecture on Management of Heart Failure.

A meeting of the branch was held on 21-2-59. Dr. G. Viswanathan presided. Sixty members and 30 representatives of the Madras State Council were present. Dr. D. Harirajan of Government General Hospital, Madras, gave a talk on Tetanus and its Management. Dr. G. Victor of Government Erskine Hospital, Madurai, spoke on Medical Emergencies. Dr. U. Sridhara of Madras spoke on Recent Advances in Dermatological Therapy.

A meeting of the branch was held on 18-4-59. Forty members were present. The members condoled the death of Dr. A. Srinivasalu Naidu. Doctors who were successful in the election of Councillors to the Tiruchy Municipality were congratulated. Dr. T. S. Balasubramanyam gave a short account of the Madras Medical Council. Dr. K. Venkata Rau of the Chest Clinic of Stanley Hospital read a paper on Coronary Insufficiency.

TIRUNELVELI DISTRICT BRANCH—Office-bearers for 1958-59 were elected with Dr. D. I. Abraham as president, Dr. P. Vadivale as vice-president and Dr. V. Sridhara Rao as hony. secretary and treasurer. A meeting of the branch was held on 28-2-59 at Nanguneri with Dr. D. I. Abraham in the chair. After the normal business was over, Dr. T. Titus gave a lecture on Hernia, which was appreciated by the members.

VIJAYAWADA BRANCH—The monthly clinical meeting of the branch was held on 15-3-59 with Dr. T. V. S. Chalapathi in the chair. Dr. S. Bala Parameswara Rao gave a lecture on 'Gross Section of Neuro-surgical problem'. Dr. K. Rangacharyvelu, president, Andhra Pradesh State Branch, addressed the members on the present day I.M.A. topics. Dr. B. Sambamurthy demonstrated a case of Dextrocardia with Situs Inversus. The office-bearers of the Andhra Pradesh State Branch attended the meeting.

VISAKHAPATNAM BRANCH—The monthly general body meeting was held on 24-1-59 in the clinical lecture hall of K. G. Hospital and it was attended by the members of the Academy of Medical Sciences of the hospital. Dr. G. V. Satyanarayanamurthy presided. Dr. B. V. Satyanarayana, Skin Specialist of K. G. Hospital demonstrated many rare cases of diseases of the skin. He also demonstrated four cases of Pellegra, better known as Pellagrous Dermatitis. The president asked the members of the branch to be members of the Academy of Medical Science.

The general body meeting of the branch was held at Nellimarla on 5-4-59. The members went to the place by a bus at 5 P.M. The meeting was presided over by Dr. N. Govindarajulu. The resolutions passed at the 66th All-India Working Committee at Visakhapatnam were explained to the house. The Government was requested to provide full modern equipment and adequate number of beds for treatment of Cancer cases in K. G. Hospital, Sisakhapetnam. A symposium on Paediatric Emergencies were held. Dr. (Mrs.) Kashef Allem spoke on Respiratory Emergencies. Dr. B. Surayanarayanrao spoke on Abdominal Colic. Dr. G. Sreeramulu, on Diarrhoea and Vomiting in Children, Dr. P. Tirumalarao, on Meningitis and Convulsions.

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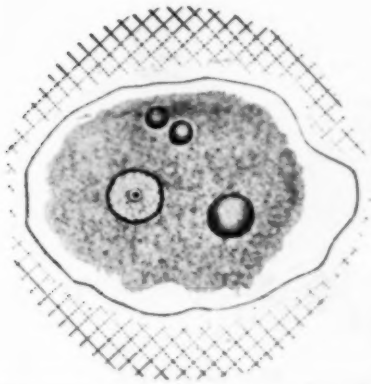

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